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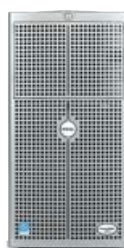
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Contents



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JUNE 2005

Regulars

9 Editorial 10 Contact us 12 How we test
42 Letters 45 Inside information
46 Kewney @ large 48 Straight talking
86 Best buys 219 Micromart
231 Index of advertisers 232 Special offers
243 In the next issue 244 Flashback

News

18 Microsoft deal on Europe
19 Free calls for rail passengers
38 IDF report: Dual-core rollout
41 Pre-pay print could boost colour
Six-page Cebit special report:
21 High definition shapes IT
22 Big screens herald low prices
Blu-ray HD format row
34 Fracas over 200Mbit mains links
35 Film data for a long life
36 Bluetooth stereo debuts
37 XP64 imminent

Features

91 Make Windows bullet proof
Your data is in danger, so check out our
feature to find out how to protect your PC
and make Windows secure

Group tests

103 Centrino laptops
Discover how Intel's second-generation
Centrino laptops perform as we put seven
to the test

121 Linux leaders
Choosing the right Linux distribution can
be confusing, so we've tested five to give
you an idea of what's available

Network

131 News
132 Why Bluetooth's successor is
creating a stir in the
business world
135 Observer Suite 10
136 O2 3G Data Card
Vector Networks PC Duo 3



139 Group test
Five Gigabit Ethernet cards on test

Cover feature 103 Centrino style

Find out whether the new Centrino laptops fulfil the promises of improved speed, audio and wireless

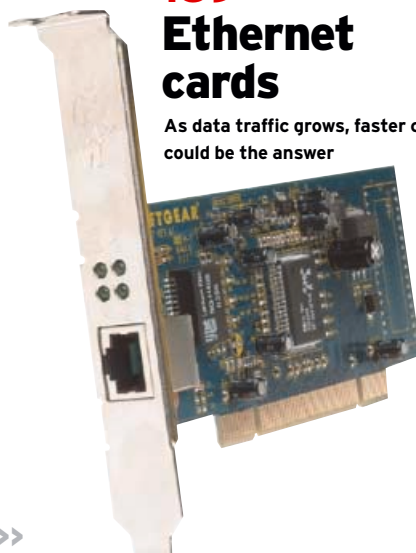


121 Linux leaders

Choosing a Linux distribution can be
daunting, so read our group test to
help you make the best decision

139 Ethernet cards

As data traffic grows, faster cards
could be the answer



91 Closed Windows

Make your PC safe from attacking
viruses and spyware by following our tips



Competitions

210 Six hard drives and three Brother all-in-ones up for grabs

Seagate is giving away six Barracuda hard drives – two internal drives, two external drives and two pocket drives, and three readers can win a Brother all-in-one device



Reviews

Mini round-up

- 54 Portable media players
- 66 Power protection

Hardware

- 51 Evesham Teramedia
- 52 Packard Bell Iextreme Gold 2104 Media Center

Peripherals

- 60 Canon Pixma IP5000
- Apple Ipod Photo
- 62 Plextor Convertx PVR
- Fujifilm Finepix F455 Zoom
- 64 JVC Everio GZ-MC200
- Optoma EP739
- 68 Apple Ipod Mini
- Shuttle XP17 Temp AR
- HP DVD 640i
- Belkin USB2 3-port hub & 15-in-1 media reader/writer
- 69 Sony Cybershot DSC-T33
- Pentax OptioWP

Components

- 70 ECS 915-A
- Sparkle Geforce 6200 TC

Overclocking

- 72 HIS Radeon X850XT Platinum Edition IceQII
- Gecube Radeon X800XL
- Aerocool Coolpanel multi-function panel
- Coolermaster Real Power RS450-ACLY
- 73 Silentmaxx Watercooled 450W PSU
- Enermax CS10068
- Tagan TG480-U22
- Small drive adapters

Software

- 74 Apple Iwork 05
- 76 Adobe Creative Suite 2 (Beta)
- 81 Kaspersky Security Suite 1
- F-Secure Security 2005
- 82 Xara3D 6
- Roxio Backup My PC Deluxe 6
- 85 Zinion Reader 3
- Directory Opus 8
- Ciphire Mail
- Rootsmagic 2 UK
- Platinum Edition



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206 Games 209 Retro 210 Competition

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Hands on

147 Contents

148 Question time

Our experts tackle your technical queries

152 Hardware

How to record and edit remotely on Media Center

154 Overclocking

Pushing the Pentium III to its limit

156 Windows

Using the boot.ini file, we customise your boot-up options

158 Linux/Unix

How to handle removable storage devices with Gnome and KDE

162 Digital imaging & video

Protect the copyright of your online images by using a watermark

164 Word processing

Search your hard drive using MSN Deskbar

181 Spreadsheets

Write a macro that adds VAT to cells

183 Sound

Get the latest tips on Windows Media Player

185 Networks

Find out how IP addresses are assigned

189 Databases

Master the tricky business of moving entries from one database to another

195 Visual programming

Support limited users in your applications

197 Windows secrets

Discover the hidden functions in Windows

203 Windows Raid 5

How to make Windows XP fit for Raid 5



Choose wireless for your media center p152



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VP201b, PC Zone
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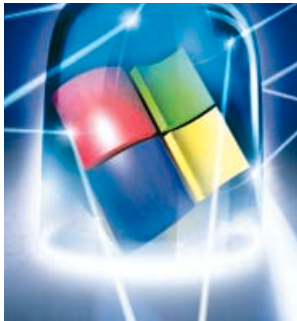




rob_jones@vnu.co.uk

Don't take security risks

Despite the warnings, too many PC users are still failing to secure their systems says Rob Jones



»» **PC security**
Follow our guide and learn how to make Windows bullet proof – see page 91



»» **Media players**
We compare 11 portable multimedia players in our mini round-up – see page 54

Security is a subject that should never be far from your mind when it comes to personal technology. If you use the Internet – and, let's face it, most of us do – then going online without any form of security can be generously described as naive or, if you prefer to speak bluntly, as an act of gross stupidity.

Sadly, in a world where we can no longer leave the door unlocked, so is it the same case in the virtual world. If you go online without any form of security you are inviting people in. The likelihood of them using your PC to commit major crime if you are a home user is pretty slim, but that doesn't mean you won't find your PC being hijacked for sending spam. If you run a small business or bank online and you leave your PC unprotected, only you and the hackers will know what secrets you are giving away.

If I were sitting reading this as you are, I know I would roll my eyes and think, 'Just who does he think he is, telling me how to secure my PC' (possibly with a few well-chosen expletives thrown in for added emphasis). And if that's your reaction, fantastic, because it means your system is locked down and protected from unwanted prying eyes.

But, despite the regular warnings given to PC users about security risks, not everyone chooses to act on the advice, hence the reason so many worms and viruses spread at such a fast pace. For too many people, security is still an afterthought, and that can be especially true among new users. It's an even greater concern when you add in the rapid rise in home wireless networks – and to illustrate this, I'll return to an issue I've raised before. In the immediate range of my house there are three wireless networks, including my own. Two are unsecured, and one is always on, happily giving free Internet access to anyone that wants a connection. At best, if my unknown neighbour is on a capped service then he is potentially giving away chunks of his monthly bandwidth. But for a hacker, the open invitation will offer far more sinister opportunities.

However, as Barry Fox points out in his column this month, if IT manufacturers can't get security right, then how can we expect everyone else to perfect it? This is a fair point but not an excuse – there has been plenty written in the past about the need for good security and there will be plenty more written in the future. And we all know that we will never stop the determined hacker, just as we won't stop the determined thief. But we hope that by having solid measures in place, we are harder to break down and therefore a less attractive target.

And that is what we hope to help you achieve this month in *PCW*. On page 91, we've taken an in-depth look at security and how best to make Windows bullet proof. We've looked at the issues surrounding security and included a number of simple steps you can take to make it harder for malicious code or hackers to get into your system. Sticking with Windows, if you're an advanced user, we've dug deep into its shell, and show you how to tune your operating system and troubleshoot your network using script commands. You'll find this on page 197 in the Hands on section.

Finally, we all know that entertainment on the move is a growing trend and, as I write this on the train, there's a guy opposite watching a movie on his portable DVD player. Yesterday I sat opposite a girl whose approach moved up a notch on the technology front – she was watching a movie on one of the multimedia players on test on page 54, where we also show you how to put a TV programme or film onto your mobile phone. So if that's of interest, we looked at 11 systems currently on the market and explain which is the best and why.

'Security is an afterthought for too many people, and that can be especially true among new users'

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Performance testing is an important part of PCW's reviewing process and to obtain our authoritative results we use the UK's best PC testing resource – VNU Labs. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs.



PCW's tests are carried out by VNU Labs, the best PC testing labs in the UK

One of the main reasons people upgrade their PCs is because their old model seems 'too slow'. But how do you tell whether the one you're going to replace it with is any faster? At PCW we take PC testing very seriously and we have the UK's best PC testing labs – VNU Labs – on tap to help us give you reliable, authoritative performance figures, to help you with your purchasing decisions.

It's true that speed isn't everything, but it's an important part of the buying equation, especially when there are so many possible combinations of components out there. As many of our PC group tests are based on price bands, checking the performance is even more important – a PC might have a lot of bells and whistles, but if the core system is underperforming compared to the rest of the group, you need to know about it before you part with your hard-earned cash.

In VNU's UK Labs, which is part of a network of European VNU Labs we call upon, our staff have over 20 years of combined testing experience and have tested thousands of hardware products in every conceivable category. We know all the perils and pitfalls of practical benchmarking, and we contribute to the development of industry standard benchmarks through our full membership of Bapco (www.bapco.com), the non-profit benchmark consortium. We are also a media member of the Futuremark Benchmark Development Program (www.futuremark.com). Below you'll find short descriptions of the main benchmarks we use for testing PC systems and components.

Sysmark 2004

Sysmark 2004 is a system productivity benchmark, designed to reflect system performance when running the most popular application software in real-world scenarios with real-world workloads.

Sysmark 2004 uses 15 full applications, plus anti-virus and compression software, divided into two categories: Office Productivity and Internet Content Creation.

It runs through predefined scripts that include concurrent running of applications to test multitasking capabilities.

Scores are calculated for each category based on the scores for various sub-tasks. Individual tasks are scored based on 'response time' – the time the system takes to complete a task initiated by the user. Responsiveness to the user is scored more highly than the total time taken to complete a number of tasks.

These scores are based on a comparison between the test system and a Bapco reference PC with a 2GHz Pentium 4 processor, an Intel D845GBV-based motherboard, 512MB of DDR266 CL2.5 Ram, a 64MB ATI Radeon 9700 Pro graphics card, an 80GB IBM 2MB cache, 7,200rpm hard drive formatted with the NTFS file system and Windows XP SP1. A score of 100 indicates that the system has a performance equal to the reference PC, 200 indicates twice the performance and so on. We run the benchmark at a resolution of 1,024 x 768 in 16bit colour. It is run three times, rebooting between each category.

When testing PCs and notebooks, we first configure them automatically with standard desktop settings. This includes removing all startup programs, automatic updates, desktop wallpaper, screensavers and proprietary system tray utilities. This is done in order to ensure the repeatability of tests.

The applications within each category of Sysmark 2004 are as follows:

Office Productivity

Adobe Acrobat 5.0.5, Microsoft Access 2002 SP2, Microsoft Excel 2002 SP2, Microsoft Outlook 2002 SP2, Microsoft Powerpoint 2002 SP2, Microsoft Word 2002 SP2, Microsoft Internet Explorer 6 SP1, Scansoft Dragon Naturally Speaking 6 Preferred, Network Associates McAfee Virus Scan 7, Winzip Computing Winzip 8.1

Internet Content Creation

Adobe After Effects 5.5, Adobe Photoshop 7.01, Adobe Premiere 6.5, Discreet 3ds Max, Macromedia Dreamweaver MX, Macromedia Flash MX, Microsoft Windows Media Encoder 9 Series, Network Associates McAfee Virus Scan 7, Winzip Computing Winzip 8.1

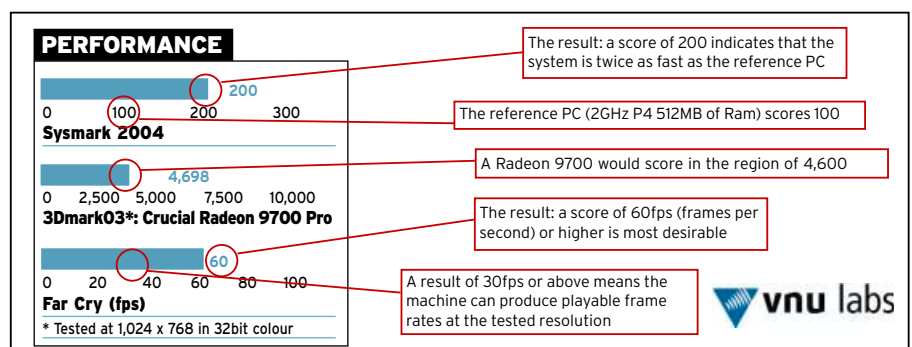
See www.bapco.com for pricing information and full details of testing strategies and methodologies.

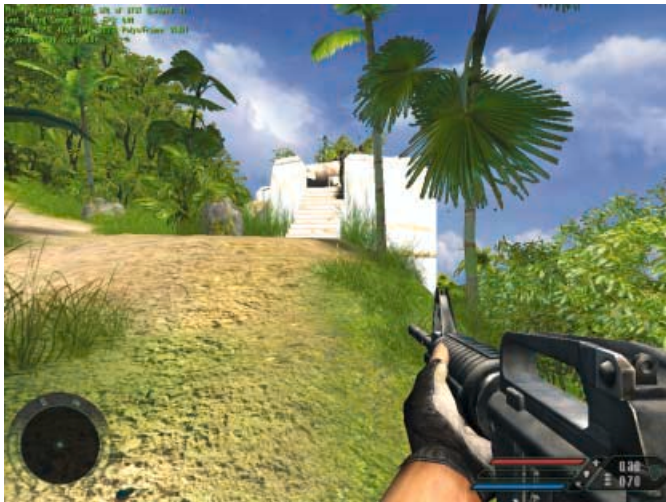
3Dmark03

3Dmark03 consists of four tests. The first examines DirectX 7 performance; the following two are DirectX 8 and the final test is DirectX 9.

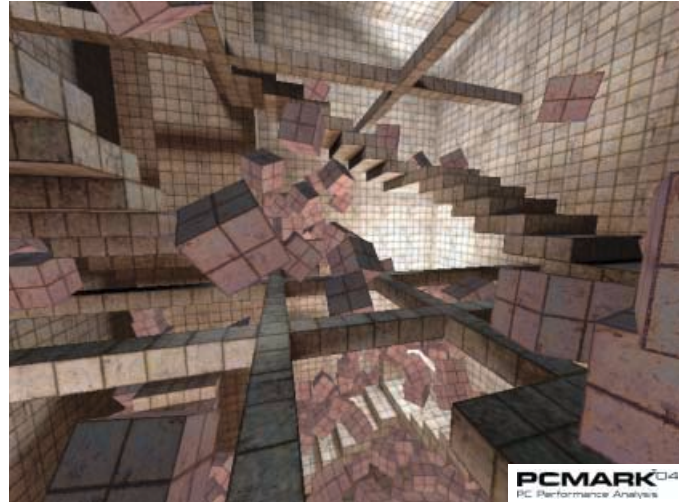
The result is calculated by taking an average of the frame rates from the first three tests. The results from the fourth test are included, but have a lesser bearing on the final score.

This version will only run fully on DirectX 9 compliant cards. 3Dmark03 is suitable for modern cards in the budget to mid-price





Far Cry is a real challenge for modern graphics cards



PCmark04 measures memory, processor, graphics and hard drive performance

ranges. For the latest cards, we use 3Dmark05. 3Dmark 2001 has now been officially retired by VNU Labs.

3Dmark05

3Dmark05 is a demanding test designed to stress the latest generation of DirectX 9-compliant cards and will only work with models that support Pixel Shaders 2 and have DirectX 9c installed.

Using the same interface as 3Dmark03, the main benchmark consists of three simulated game tests. These are designed to load the graphics subsystem as much as possible, although the CPU and other components can have an effect on the overall score, which is why 128MB of video Ram and a 2GHz CPU are part of the minimum system requirements for running the tests. For systems using older graphics cards that don't meet the 3Dmark05 requirements, we will use 3Dmark03.

Far Cry

We use the Far Cry game from Ubisoft for testing DirectX 9 gaming performance. The default demo we use is timedemo on the 'Fort' level. Far Cry's game engine is very graphics-intensive, so it presents a real

challenge to modern graphics cards. For PC and notebook testing we test at 1,024 x 768 pixels, 32bit colour, 75Hz refresh and default settings for both anti-aliasing (AA) and anisotropic filtering (AF).

When it comes to testing graphics cards, in addition to the standard test, the card is also tested at 1,024 x 768 with 4x AA and 4x AF; 1,600 x 1,200 with 4x AA and 4x AF and 1,600 x 1,200 with maximum quality settings.

PCmark04

Part-way between application-based and entirely synthetic benchmarks, PCmark04 uses a hybrid technology, employing portions of real applications to produce realistic performance results without the overhead of installing complete software packages.

It has four main suites of tests for measuring memory, processor, graphics and hard drive performance, as well as that of the overall system. For more information on PCmark and 3Dmark, visit www.futuremark.com.

Battery test

To get a feeling for the minimum length of time a notebook battery will last, we run a specific test. Based on a looping Excel Visual

Basic application, the test opens worksheets, generates random numbers and pivot tables, then zooms, and adjusts the brightness and contrast of an image. The running time is recorded to disk every 30 seconds until the battery power diminishes.

Test beds

When testing components and peripherals, we use several standard Intel and AMD-based test rigs. These are as follows:

- CPUs and memory: 3.4GHz Intel Pentium 4 Extreme Edition, AMD Athlon 64 4000+, AMD Athlon 64 3400+
- Memory: 1GB of Crucial PC5300 DDR2 Ram (Intel) or PC3200 (DDR1-400) (AMD)
- Motherboards: Asus P5AD2-E Premium (Intel); ECS KN-1 (AMD)
- Hard drive: 120GB Western Digital EIDE model with an 8MB buffer
- Graphics card: ATI Radeon X850XT PCI Express
- Operating system: Windows XP SP2

For hard drive testing, we use a dedicated Intel P4 3.4GHz system with 512MB of Buffalo PC5300 DDR2 Ram, an Nvidia Geforce 6800 PCI Express graphics card and an Intel D925XECV2 motherboard.



3Dmark05 pushes modern graphics cards to their limits

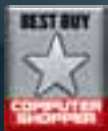


3Dmark03 is used to test DirectX 7/8 graphics cards

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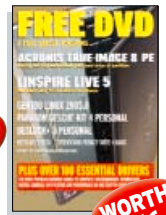
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Deslock+ 3 Personal

Encryption program like no other **Page 239**

CyberScrub Privacy Suite 4 Basic

Eliminate all files and folders with this easy suite **Page 240**



CD2 drivers list

PCW toolkit

CD2 has a raft of drivers for popular products, all brought together on one CD. While every effort has been taken to maintain the accuracy of the drivers, some may have been upgraded between creating this CD and PCW's on-sale date. Also, some manufacturers refused permission for their drivers to appear on this CD. Drivers for the following manufacturers are included:

Digital cameras

Fujifilm
Konica
Olympus

Mp3 players

Winamp
Musicmatch

Soundcards

Terratec

TV tuners/Monitors

ATI
Acer

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Contents

Six-page Cebit special

- 21 This 7megapixel phonecam set the tone at this year's Cebit, which was dominated by high-definition technologies
- 22 Big screens, lower prices
- 34 Mains links hits 200Mbit
- 35 Film makes comeback Nanopunch terastore
- 36 Bluetooth stereo debuts
- 37 XP64 launch imminent



Focus on IDF

38/39 Kelvyn Taylor spells out Intel's roadmap in a report from the company's geekfest

Other news

- 41 New Photonics chip
Pre-pay boost for colour

>> Disk record

Hitachi has packed a record 230GB per square inch of a hard disk by stacking data bits vertically at each location. It would allow a 3.5in drive to pack 1TB of data. A 2.5in drive will ship by the end of the year.

>> XP No player

The version of Windows XP sold without Media Player to comply with an EC ruling will be called Home Edition N, Microsoft has agreed.

NTL trials 18Mbit ADSL2+ links

Cable operator NTL has followed BT in starting trials of ADSL2+ offering speeds of up to 18Mbits/sec. But it says its service will be much faster than BT's for most people as the technology is very sensitive to distance and 95 per cent of its customers live with 1km of a fibre link, compared to 5per cent of its rival's. The figures assume that BT does not run fibre to its neighbourhood boxes, which will bring many more people within range.

NTL already offers broadband over its cable network, which it says now reaches one in three UK homes and runs phone services over the final copper link to its customers. The ADSL2+ services will piggy-back this link, just as BT's will use the local loop to the exchange.

Service providers continued their price and speeds war last month, with Tiscali offering a 2Mbits/sec link, capped at 15GB, for £19.99 a month. Plusnet offered uncapped 512KB access for £14.99 a month.

64bit AMD Centrino rival

AMD has pipped Intel yet again with the release of the first 64bit x86 processors to be designed and optimised specifically for mobile use. Seven Turion processors were launched at Cebit after being announced last year as an answer to Intel's highly-successful Centrino mobile platform, now in its second (Sonoma) generation.

Notebooks have been built round 64bit chips before but they used desktop processors like AMD's own Athlon 64. Turions have been redesigned from the ground up for power efficiency.

AMD has been able to force the pace on mainstream 64bit computing because Intel kept its x86 processors at 32bit, partly to protect the market for its non-x86 Itanium processors. Intel also argued, plausibly, that few desktop users yet need 64bit computing. It had to bring out its own offerings to avoid being outflanked by AMD.

Both companies also plan to launch imminently mainstream multi-core processors, including low-drain mobile models – keep an eye on www.pcw.co.uk for all the news. The multiplicity of offerings (see page 38 for Intel's roadmap) will be all the more confusing for the fact that clock-speeds are no longer cited



High-res eyes coming to a wall near you...

High-definition was the other big news at Cebit and the implications spread way beyond entertainment. Pictured is a demonstration by Sony of high-definition video links, which can be used for anything from conferencing to surveillance. Sony sees an emerging market so large that it has created a new brand name, Ipela, for products targeting it. So you can expect to see streets sprouting cameras with a resolution high enough to pick out your pimples. Turn to page 21 for the start of our six-page Cebit special report.

as an indication of performance: what matters is how much is done per tick of the clock.

AMD claims that its naming scheme for the new Turions provides a simple way to judge relative performance and 'degree of mobility', by which it means the thermal design power (TDP). The lower the TDP, the less heat is produced and the more compact the notebook can be (see table below).

It remains to be seen how important 64bit will be to

notebook buyers, but Turions could be attractive to designers as they are given little flexibility in the way they can implement Intel's Centrino platform. AMD's strategic marketing manager Dave Everitt said: 'We give manufacturers far greater scope to differentiate their products.'

Acer, Evesham and Fujitsu Siemens have all said they will offer Turion notebooks, which like Centrino will offer tri-mode Wifi as standard. **Clive Akass**

PROCESSOR	FREQUENCY	L2 CACHE	TDP	PRICE
ML-37	2GHz	1MB	35W	£189
ML-34	1.8GHz	1MB	35W	£140
MT-34	1.8GHz	1MB	25W	£143
ML-32	1.8GHz	512KB	35W	£117
MT-32	1.8GHz	512KB	25W	£120
ML-20	1.6GHz	1MB	35W	£98
MT-30	1.6GHz	1MB	25W	£101

The new Turion processors, showing bulk prices. The first two letters of the name indicate class - M for mobile, with the second letter indicating the power rating. The lower the drain the higher the letter, which is seen as a measure of mobility. The figures in the names indicate relative performance.



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Make Windows bullet proof
Turn to page 91 to find out about threats to your PC and how to improve its security



Free calls at rail stations

You can make free phone calls using Wifi-equipped laptops or handhelds from major UK railway stations thanks to a deal between hotspot provider Broadreach and peer-to-peer telephony specialist Skype.

All you need to do is register with Skype and download a software client – there are versions for Windows, Mac OSX, Linux and Pocket PC. The software logs on to Broadreach's Readyto surf hotspots automatically – there are no tricky log-ons.

Calls between Skype users are free but there are charges for calls to standard phones – prices start at €1.7 cents per minute, which is much cheaper than a mobile call. You pre-pay Skype for these calls on much the same basis as a standard phone card.

The free service extends to all Broadreach Readyto surf



Zennström demonstrates Skype while at Paddington Station

account. Alternatively, a voicemail-only subscription costs €5. The P2P Voice-over-IP service offered by Skype, which has 29

million registered users worldwide, is seen as a disruptive technology, threatening voice-call revenues of both mobile and fixed-line operators. Mobile phones supporting both cellular and Wifi calls are beginning to trickle on to the market.

Skype co-founder and chief executive Niklas Zennström said, as he demonstrated the new free service at Paddington Station, that telephone companies had had things their own way for too long. 'We are providing competition.'

hotspots, which are to be found in Virgin Megastores, Eurostar trains and various travellers' eating places, as well as many railway stations.

Broadreach is offering free Internet phone calls as a way of promoting its wireless Internet access, for which there is a variety of payment options.

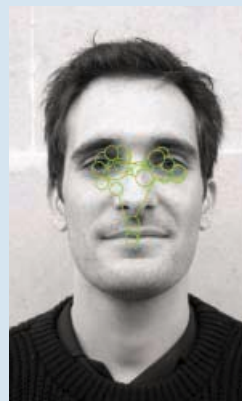
Skype 1.2 is now available and it includes the ability to receive phone calls from non-Skype users and to pick up voicemail messages. A Skype number costs €10 for three months, but that includes a free voicemail

Reverse-engineer your brain

Appearances can be deceptive. When you look at someone's face you may 'see' a continuous image but this is not what your eyes are taking in: as this picture shows, they are moving all the time. The rings show the aim of someone's eyes at eight-second intervals while looking at the image. The implication is that what we 'see' is a construction of the brain and not necessarily what appears on the retina.

It is one of the illustrations from a book called *Mind Hacks: Tips and Tools for Using Your Brain* (ISBN 0-596-00779-5, £17.50), by Tom Stafford and (the face behind the rings) Matt Webb. The latest in the 'Hacks' computing series published by O'Reilly, it is a kind of DIY manual for reverse engineering the brain by using little tricks to figure out how it works. Some of the material will be old hat to psychology students but it is an interesting take for computer geeks – though it begs a lot of questions.

Clive Akass



Picture: Dorian McFarland <http://isness.org/lofoto>

Superbattery charges in one minute

Toshiba has developed a Lithium-ion battery that can charge up to 80 per cent capacity in less than a minute. It uses particles less than 100nanometres across to store vast numbers of lithium ions without damaging the

electrodes. The battery, which can be fully charged in 10 minutes, will appear in products next year, Toshiba said.

'Initial applications will be in the automotive and industrial sectors... The battery's advantages in size, weight and

safety highly suit it for a role as an alternative power source for hybrid electric vehicles,' a spokesman said.

The battery loses less than one per cent of capacity per 1,000 recharges, and can operate at between -40°C and +45°C.

>> HP cost cutter

HP should focus on operations and cost cutting, according to its new chief executive, former NCR head Mark Hurd. But he told an press conference that it was too early to talk about changes in strategy.

He declined to say if cost cutting would lead to layoffs or the spinning off of its PC, print and imaging divisions. On the ousting of predecessor Carly Fiorina, he said: 'I am not here today to pass judgement about the past.' See www.pcw.co.uk/news/1162248 for more on this story.

>> Self replicator

Bath University has unveiled a machine that could make household objects to order. The device has been adapted from a £25,000 fast prototyper used in the car industry, said Dr Adrian Bowyer of Bath's Centre for Biomimetics.

It can make metal and plastic objects up to 30cm in length, width or height and could eventually create the parts needed to reproduce itself – bringing the cost down to that of a standard PC printer, Bowyer said. Humans would still be needed to assemble it.

Bowyer plans to make the technology freely available if his concept is realised. The idea of self-replicating machines was first proposed by Hungarian John von Neumann. It has been suggested that they could be used to explore the galaxy.

Iain Thomson

>> Quiet vision

Sapphire says its new ATI-based Ultimate X800XL graphics card is nearly silent operation thanks to clever cooling. It supports dual displays.

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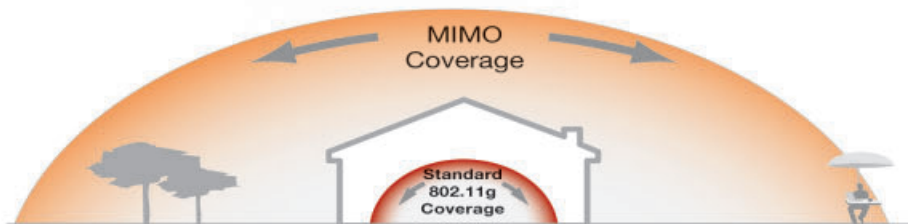
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Highs and lows of Cebit

At the world's top IT show, high-definition video proved it is shaping the industry, as low-bandwidth data broadcast made a debut. Clive Akass was there

Cebit is not only the world's biggest computer show, it is arguably the best, and certainly the most, comprehensive. Nowhere else can you view in one place every conceivable aspect of IT – from banking back-end systems to a low-cost Taiwanese mp3 player. The global trend is for smaller, more specialised shows, but this makes the Cebit overview all the more valuable.



Yes, it's the first-ever 7megapixel phone-cam and it comes with a 3x optical zoom and the ability to add a telephoto or wide-angle lens

However, even Cebit is shrinking. Several big names, such as HP, were missing this year. Other companies had a reduced presence and there were fewer big product launches. Attendance was down 9,000 to 480,000 (compared with a peak 850,000 in 2001), although this is still a huge figure and the organiser is surely right in claiming the average 'quality' of visitors is up – that is, a high proportion are IT professionals.

Just like CES in January, the major trend was high definition (HD), even though HD TV services will not be widespread in Europe for at least three years – the UK's first offering, from BSkyB, is due to start next year. But it is no exaggeration to say that the near-term future of the industry rests on the technology.

HD means people will need new recorders and storage, faster processors, better screens and

more bandwidth to and within the home. In other words, many new products and technologies need to come on stream.

There are the inevitable format wars this year – in home networking (see page 34) and storage (see page 22). But the most visible manifestation of HD is in displays, which are bigger and better than ever before and are about to become cheaper (see page 22).

The scramble for high-definition has even affected mobiles, with Samsung displaying a 7megapixel phonecam (pictured left). In truth, it looks a bit of a gimmick – a phone stuck on the back of a camera – but could be the start of a trend. More significant may be the quiet debut of mobiles capable of receiving multimedia data broadcasts (see below).

Samsung was indubitably the star of the show, bucking the low-key Cebit trend with an



Sony might have been upstaged by Samsung, but it still comes up trumps with the products. This HDR FX1 is the first consumer camera to support 1060-line high-definition format in a 16:9 aspect ratio. It will set you back more than £1,500

extravagant presence and a breathtaking range of new products. Samsung is being described as the new Sony – it made \$10bn (£5.34bn) last year, 10 times the profit of its Japanese rival. On paper is worth twice as much, and it wasn't going to let anyone forget it.

Dark-horse DMB notebook was pick of the show

My pick of Cebit was Samsung's Q30 laptop, which was launched before the show and does not even use Intel's latest Sonoma platform – Samsung launched three other models (X20, X25 and X50) that do. I chose the Q30 because it was displayed equipped for DMB, the multimedia version of DAB digital radio technology.

Data broadcasting has the potential to develop into a new medium with elements of TV, radio, print and the Internet. It can be delivered using either DMB or DVB-H, which uses the digital TV signal to similar effect and both are optimised for mobile reception.

They are a stark contrast to HD (see above). They need less bandwidth because they are targeted at smaller screens and they are viewed at 18in rather than 6ft, making them viable for text as well as stills, video



and audio. PCW has featured the component technology, but for the first time at Cebit there were finished products on show – all from Korea, a pioneer in DVB-H and DMB.

Samsung launched a DMB-enabled phone months

Clockwise from top left: Nexio with DMB module, LG DMB phone, Q30 laptop and two Samsung phones that support DVB-H

ago and at Cebit showed two models supporting DVB-H. LG showed a DMB phone, the

LT1000 – the company has 130 researchers working on the technology, which is a measure of how seriously it is taken.

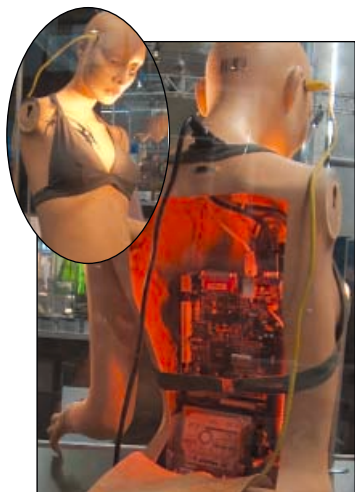
Samsung's Nexio handheld (top left), for which there is a DMB add-on, shows the size this technology is most likely to take as people will surely want a larger screen than that of the average mobile phone.

Both DVD-H and DMB are being piloted in Britain, where companies such as Frontier and Radioscape are developing the enabling technologies.

Power drain could be an issue on handhelds so laptops, with their bigger batteries, look a more viable early platform.

Hence my choice of the Q30 laptop. It was the dark horse of Cebit, with a largely-unnoticed technology that could one day become hard to ignore.

CA



Femme fatale or innovative design?

We've heard of new PC models but this is ridiculous. Above is one of the entries in a Samsung competition for innovative PC designs it may not be practical but that's not the point – it was an eye-catching way to pimp a PC. Of the other 'pimped' PCs, one looked like a rusty old boiler, with red taps for controls and another was like a fantasy tower.

Giant screens, low prices

Samsung set the pace for display sizes at Cebit with a 102in plasma display and an 82in LCD panel. But the show was awash with good-looking plasma, LCD and back-projector models and the big news is that mainstream displays will get larger and cheaper.

Bob Raikes, head of display analyst Meko, confessed to be most impressed by the 82in LCD. 'It's astonishing when you think that not long ago analysts were saying that the LCD would be limited to 30in, with PDP [plasma] taking the market for larger sizes.'

He said both Samsung and Sharp are setting up high-output plants that will flood the market with large flat panels. 'You can



Sharp's 65in LCD screen: not as big as Samsung's, but still impressive

expect to see 32in LCD panels in the shops for less than €1,000 (£680 approx) by Christmas.'

Many of the displays on show were packed with television sets and purported to be 'ready' for high-definition TV, although there is some ambiguity about what this means (see Gordon Laing, page 45). Sharp showed

10 models in its Aquos range, the largest available being the 45in LC-45GD1E.

HDTV 1080i (interlaced) has a resolution of 1,920 x 1,080 – almost five times greater than that of Europe's Pal.

The TV market alone is enough to have display makers slaving. In Germany,

for instance, there are some 60 million Pal TV sets using cumbersome tubes – vendors hope that all are about to be superseded by HD flat panels.

Samsung showed a 71in TV using the same DLP technology used in digital projectors. It also boasted a technology called Magicnet that allows several screens to share multimedia files over a network from the same server.

Clive Akass

Blu-ray drive reads DVD and CD formats

Supporters of the HD-DVD and Blu-ray high-definition storage technologies held rival press conferences at Cebit in a replay of the battle over DVD standards, which has more or less played itself out with the emergence of drives supporting all formats

Some experts believe that a similar compromise is possible in the HD battle, but neither camp looked in the right mood for one at Cebit.

Philips showed a Blu-ray drive that belied one of the main advantages claimed by the

HD-DVD camp – that only its technology could offer HD drives capable of reading and writing CD and DVD formats.

The Philips drive (pictured right) can do just that and the company says it will be available by Christmas. Sony is said to have produced a similar drive.

Blu-ray got a boost during the show with the announcement that Apple is supporting it.

HD-DVD, backed by NEC, Sanyo and Toshiba, looks like a loser judged only on capacity. Its discs will hold 15GB or 30GB

Right: Philips says this PC drive, which reads and writes Blu-ray, DVD and CD formats, will be on sale by Christmas. It uses a separate blue, red and infra-red for each format, but has a single optical system

Below: NEC promo picture of an HD-DVD drive emphasising backwards compatibility with DVD and CD

double-sided; Blu-ray discs hold 25GB single-sided and 50GB dual-layer. Four-layer Blu-ray disks storing 100MB are in the pipeline and Sony has tested an eight-layer one storing 200MB

But Masato Otsuka, general manager of the engineering department at disk giant Memory-Tech Corporation, said HD-DVD is intrinsically cheaper as the media can be made in existing DVD plants so that vendors do not have to invest hugely in expensive new ones. He also said HD-DVD



is the preferred choice of Hollywood because it has a read-only format. 'There will be no titles available for Blu-ray,' he said.

However, Blu-ray also has Hollywood support (see box left) and even studios that have declared for one format are not necessarily ruling out publishing in the other too.

Clive Akass

Sony prepares film bonanza

Sony is making digital masters of all its films in high-definition (HD) format so they can be sold on Blu-ray discs when they hit the market. Chris Deering, president of Sony Europe, said at Cebit: 'There will be an immense choice from day one.'

The offerings will include some 6,000 titles Sony bought with MGM Studios.

Deering said: 'High definition will become the cornerstone of [Sony's] activities in video, audio, TV and movies.'

He added, referring to next year's launch of the Playstation 3 console: 'You can bet that HD is part of Sony's Playstation programme.'

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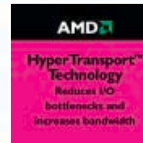
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rockdirect have teamed up with Cancer Research UK to bring a new colour to the Pegasus Ti range and help raise money for the charity.

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Only 20 notebooks take Express

Only 20 notebooks using the new Express Card slot have been submitted for approval, the PCMCIA organisation revealed at CeBIT. But 53 devices designed to fit into the slots have been submitted, said the organisation's president Bradley Saunders.

They include a TV card (above) from Avermedia and a gigabit Ethernet card from Abocom. Lifeview showed a Express Card TV adapter on its stand.

Express Card slots allow peripherals to use the fast PCI Express bus implemented on the latest Sonoma notebooks, but few of the first models support it and those that do still offer the older PC Card slot.

The two slots will co-exist for some time, Saunders said. The slot is also likely to be used in desktop PCs to allow peripherals to be added without opening the system box. The narrow Express Card is likely to supersede both the bigger version and the old PC Card. www.avermedia.com; www.abocom.com.tw; www.lifeview.com

200Mbit mains links spark

A fracas has erupted over technology that will allow devices to swap data over home electricity lines fast enough to deliver three high-definition (HD) video streams simultaneously.

It came to a head at CeBIT, when Panasonic outlined plans to put its own version into a single chip for consumer electronics devices, allowing them to be linked at 170Mbits/sec simply by plugging them into the mains. Ethernet protocols are used which also allow the 'instant network' to talk to computers.

Panasonic has formed an association called the CE-Powerline Communication Alliance (CEPCA) to encourage other companies to 'collaborate'. Sony and Mitsubishi signed up. So, according to executives, have about 30 other companies including 'a very major European consumer electronics manufacturer'.

Akitoshi Aritaka, director of Panasonic's broadband communications development centre, said the idea was to agree an architecture by which devices using different technologies could 'arbitrate' a way to swap data. This would allow innovation without sacrificing interoperability.

Sounds fair enough – except that two other bodies claim to



This is DS2's demonstration of its 200Mbits/sec data-over-mains technology. The two screens on the right are showing 25Mbits/sec high-definition video streams and the other windows four standard TV streams - all delivered over a single mains link via the plug-in DS2 modems visible beneath the displays. Corinex (www.corinex.com) says it will be selling a €90 (£62 approx) DS2-based modem in the UK within a couple of months

DS2 was once a leading light of the best-known PLC organisation, the Homeplug Powerline Alliance (HPA), which claims to have about 90 member companies. PLC products sold in Britain conform to its Homeplug 1 spec for data rates up to 14Mbits/sec. Arinez claimed DS2 left the HPA because it was in the process of promoting the technology of its leading light, Intellon.

Two booths down Intellon was showing a (rated) 200Mbits/sec system using a projected Homeplug AV standard. Company president Ronald Gibbery brushed aside the challenge from Panasonic and said Sony, also a Homeplug member, was in CEPCA simply to avoid being outflanked. He dismissed the UPA as 'basically an organisation of DS2 and its customers'.

He claimed: 'DS2 is using its own proprietary technology with all that means. You have one supplier. If DS2 goes you are stuck.'

Fast PLC would clearly transform home networking – vendors say they can get around concerns about RF interference by avoiding certain frequencies. But no-one needs another standards battle, and Panasonic might just have the clout to push its own technology to the fore, simply by sticking it into products.

So, is the battle about technology or about the money to be made from it? Ingo Chmeilski, director of Panasonic's European network design centre, said with disarming honesty: 'It's a bit of both.'

be doing much the same thing. Judging from companies at the CeBIT stand dedicated to Power Line Communications (PLC), these two are politely at loggerheads – although both demonstrated networks rated 200Mbits/sec (as with most quoted network data rates, the real throughput will be at least 25 per cent less).

The Spanish company DS2, which makes 200Mbits/sec PLC modules for use in other people's products, demonstrated two HD and four standard TV video streams being carried on one powerline.

DS2 is a member of the Universal Powerline Association dedicated to delivering products that 'meet agreed specifications'. The UPA stance on CEPCA has yet to be decided, but DS2 business development manager David Arinez said the Panasonic move would serve to promote interest in the PLC.

Like many on the stand, he doubted if Panasonic has actually got a manufacturable PLC chip. Nodding to the DS2 demonstration, he added pointedly: 'At least we have products we can show.'

Watch it... robot spying on you

You'd be hard put to guess what is happening in this picture, unless you've read our CeBIT blog or visited the Sony Ericsson stand at the show.

The ball on the podium is a robot camera that can trundle about under Bluetooth control beaming what it sees back to the phone. It's just a prototype but may be developed into a product. The man on the stand said: 'It's just a bit of fun. You can send the robot up to 50m away to take pictures.' Sounds like the kind of fun that could get you arrested.



CA

Film your data for long life

Scientists seeking a way to preserve data beyond the lifetime of standard storage have reverted to a medium that predates the computer era – film.

It may seem a strange choice given the problems archivists have had preserving old films, but these date from when unstable chemicals such as silver nitrate were used.

Modern high-resolution colour film can last up to 500 years, according to Dolf Wipfli, chief executive of Swiss Data Safe (SDS).

SDS uses technology developed by Germany's Fraunhofer Institute to write high-density data to film using lasers.

Wipfli says this technology has other advantages, in addition to data lifetime, over rival methods such as Plasmon's UDO drives (see below right). It can be used when dealing with analogue or digital information. This method gets round the need to preserve a drive as well as media, enabling future generations to read the data.

Famously, the BBC had problems finding an optical drive capable of reading its Millennium Domesday Project files only a few months after they were finished. Plasmon guarantees to maintain a stock of UDO drives for the lifetime of the medium. But Wipfli says: 'All you need to

read our film is light and a magnifying glass. You don't need a Blue-ray laser or anything like that.'

The long lifetime also frees archivists from the need for refresh cycles, under which old data is rewritten to new media to preserve it. Up to 3TB can be stored on a 40cm roll of film, which looks bulky at a time when we are getting used to very high data densities.

But it will allow you to store a lot of data easily and safely, Wipfli said at Cebit. Long-term archiving is becoming a legal issue because of requirements in some countries that companies preserve data, such as internal emails.

www.swissdatasafe.ch



>> Sign of times

This may look like a piece of technology from the past, but don't be fooled by its cumbersome exterior. It will impeccably forge your signature, according to vendor Signascript.

The machine can be used to write letters in your own handwriting – colleges apparently use them for diplomas. Authors can use them to sign books. But Signawriter insists on a security regime before programming your signature.

There are software products that turn handwriting into a printer font, but Signascript says this is not the same as something written by pen.

www.signascript.fr

>> UDO jukebox

Long-term storage specialist Plasmon was also at Cebit, showing its latest Gx174 archive jukebox that can store up to 5TB using 30GB UDO cartridges. UDO drives use the same blue lasers at the centre of emerging HD and Blu-ray drives (see page 22) but the disks are made to higher specs and have an extended life.

www.plasmon.com

>> Converter card

ECS showed its PF88 card, which allows a P4 motherboard to use a rival AMD chip. The first PF88-compatible motherboard uses an Intel P4 LGA775 socket, with four slots of DDR2 667 memory, a 1066MHz front-side bus, and support for SATA2, GigaLan, and 1394a Firewire. The PF88 allows you to swap in an AMD socket 939 processor. Look out for a review in an upcoming issue.

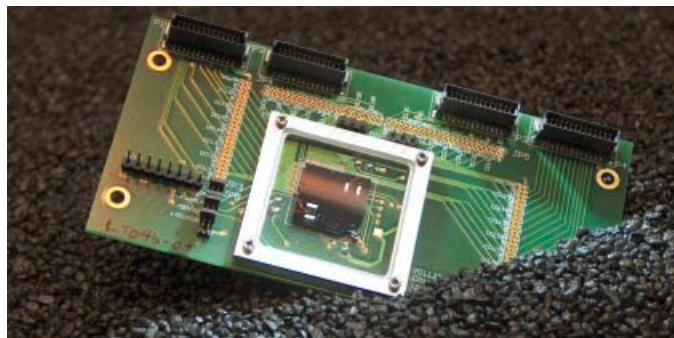
Nanopunch puts 1TB on postage stamp

IBM researchers have created a nanoscale version of punch cards, the earliest form of automated data-entry, to produce a device capable of storing a terabit per square inch – the equivalent of 25 DVDs on a postage stamp.

The device uses a tiny Micro-mechanical System (Mems) probe to prod a polymer medium to produce a pit so small that 50,000 would fit into the full stop at the end of this sentence. The probe packs a heater that softens the polymer just enough to allow pitting.

Reading is done by passing the warm probe over the pit and measuring the change of resistance as it dips inside, which has a slight cooling effect. Data can be erased by reheating.

Read and write speeds similar to those of flash memory are achieved by creating an array of probes – 4,096 of them in the module pictured – allowing many bits to be



Prototype card with the Millipede storage device (inside white square)

written at once. This gave rise to the name Millipede for the project at IBM's Zurich lab.

IBM says the technology could be refined to achieve bit densities of molecular levels and the power drain is small enough for them to be used in mobile phones. They would allow an SD card to pack several times as much storage as today's average PC.

Lab communications manager Karin Vey says the devices are also quite robust. 'They can be dropped without damage.'

But Jeff Ellerbruch, director of marketing at flash module vendor Sandisk, said it will be at least five years before any 'disruptive' technology can challenge solid-state

memory for mobile storage. 'It is one thing to produce these devices in the lab, but quite another to mass produce them. People have been making great claims about holographic storage, but we have yet to see products and we are unlikely to for some time.'

Meanwhile, he said, solid-state data densities will rise and the per-MB price will drop. Ellerbruch flourished a 2GB Titanium USB drive and a 1GB xD Picture Card, of the type used in Fuji and Olympus cameras. He said xD capacities can be increased to 8GB.

Sandisk also launched a USB drive with a fingerprint reader that can boot authorised users directly into their favourite apps.



Still cruising... 2GB Cruzer Titanium drive



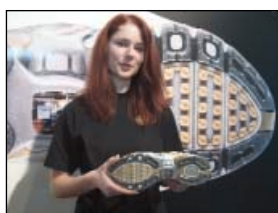
>> **Seeing the past**

Germany's Fraunhofer Research Institute showed a great application of what is called augmented reality. It is a telescope through which you can literally see the past. You can put it at a historic site where it will superimpose views from different ages. It is being used to show the location of fossils at a prehistoric site at Darmstadt. www.fraunhofer.de



>> **SLI record**

Asus claimed to have broken the 3Dmark05 record with a score of 10,118 points, with this A8N-SLI Deluxe motherboard, Athlon FX55 processor and two NV45 Ultra graphics cards, linked as shown by the Serial Link Interface bridge. Asus also showed a motherboard with a built-in TV tuner.



>> **Bless my sole**

Yes, it is what we have all been waiting for... the smart shoe. Adidas has embedded a chip that adjusts the springiness of the sole according to how you are moving.

>> **Easy Wifi**

Linksys claims setting up Wifi is 'as easy as pushing a button' with its Secure Easy Setup feature that automatically configures linked devices and sets up WPA security. Products using it will launch shortly.

Bluetooth stereo debuts

Cebit saw the tentative debut of Bluetooth stereo headsets that could revolutionise mobile device design – but none of the best-known vendors had models on show.

There was no specification (or profile, as the Bluetooth people have it) for stereo in early versions of the technology and little headroom in the maximum data rate of 700kbits/sec. But a profile has now been agreed and the latest Bluetooth 2 spec with extended data rate (EDR) offers speeds up to 3Mbits/sec.

Bluetooth stereo is tricky to implement because the headsets also have to support telephony, allowing calls to interrupt the audio stream. The big question is whether it will affect the kind of mobile that people buy because they can use a single pocket-held device to listen to music and make calls.

Small phones might cease to dominate and iPod-style limited-function players could go out of fashion, particularly as



Jabra headset supports telephony and music



Left: Cellink cordless stereo headset

Below: Aircom model with EDR



the increased use of mobiles to view images favours devices with larger screens.

Neither Nokia nor Sony Ericsson showed Bluetooth stereo headsets, though they are supported in the latest Symbian operating system and both companies showed music-playing phones (see below). Samsung showed a stereo-enabled phone but no supporting cordless headset.

The man on headset specialist Plantronics's stand appeared not to have heard of the idea, but rival Jabra said it had Bluetooth stereo models in development. Senior product marketing

manager Niels Knudsen said: 'We do not think the market is quite ready for them yet.'

Jabra did have three corded models (above left) that offer a similar combination of stereo audio and hands-free telephony.

However, Anycom showed a full Bluetooth EDR headset (above right) that was due to ship to Britain by the time you read this. It will sell for about £63 ex VAT. Taiwan-based Air2U and Cellink showed models, although neither supports Bluetooth 2.

www.eu.cellink.com;
www.anycom.com;
www.air2u.com.tw

Operators wary of new phone features

Samsung's 7 megapixel camera phone (see page 21) was far from the only sign of the way cellphones are transmuting into general-purpose mobile devices.

But there were signs at Cebit that phone operators are resisting functions that threaten their download revenues, such as Bluetooth links that can take tracks from a PC. Rumour had it that this was behind Motorola's mysterious



Musical phone... Sony Ericsson's W800 is said to have Walkman-class sound quality, but will users download tracks by air?

withdrawal from the show of a phone that could download iTunes tracks, bypassing the cellular network.

However, it did not stop Sony Ericsson showing its W800 Walkman phone that has a 2 megapixel camera as well as high-quality audio.

Samsung showed what it called a music smartphone, the SGH-i300, complete with a 3GB hard disk. Nokia's new 6680 has two cameras, plus software called Xpressprint that lets you print photos directly from the phone.

Siemens offered a pair of speakers and a phone docking station, called the Mobile Music set, that allows you to listen to music or the radio over your phone. Its SXG75 phone has built-in GPS and Palmone has signed a deal with Tomtom to build a new in-car navigation system called the GPS Navigator.

Sub-audio death-ray horror

A low-frequency loudspeaker made out of a turbine was shown by a Swedish company called Rotosub. The device, which comes in many sizes, twists the turbine blades as it rotates to produce sound that can be below the human level of hearing.

Applications range from bass speakers for rock-concerts to anti-noise generators. And something more sinister - it seems we can become very disoriented, even disabled, by very loud sounds at very low frequencies. Rotosub president Lars Stomback said he believed the US had tried using this as a form of audio (or rather sub-audio) death ray. He said reassuringly: 'We've done nothing like that.'

XP64 launch imminent

The 64bit versions of Windows XP Professional and Windows Server 2003 will be launched before the end of April, Microsoft said at CeBIT. XP will be available initially only in the Professional edition, with Media Center and Tablet PC versions to follow.

It will need a clean install – that is, beta versions will have to be uninstalled. ‘Obviously we recommend you do a complete backup first,’ said Brian Marr, senior product manager for XP64 Pro.

It will only be available for purchase with a PC; but if you are building your own 64bit system you should be able to buy code from component suppliers, Marr said. ‘It will be much like the situation with the Media Center edition.’

If you are running 32bit XP on a 64bit PC you will be entitled to a free upgrade – though, oddly, your supplier has the option of refusing you one. This is because 32bit drivers do not work with the 64bit code and vendors need to ensure their hardware is supported.

You will still be able to swap your 32bit code for the 64bit version online but your supplier can also refuse support. Marr said a trial version will be available to test your PC’s compatibility.

XP64 happily runs 32bit programs, except those older ones that still contain 16bit code – which is no longer supported. Some 32bit applications will even run faster, taking advantage of the fact that 64bit registers (the

holding areas used during processing) can act as dual 32bit ones. But Marr said: ‘You will see little difference in standard Office applications.’

The code expands the PC memory space from 4GB to 128GB real memory and 16TB of virtual (or disk-based) memory. The 128GB limit stems from the fact that it was the largest memory Microsoft could find on which to test the code and also the largest its customers could conceive of using.

Marr was cautious about that one. ‘I am not going to go down in history as the man who said it was the most people would ever need,’ he said, in a wry reference to Bill Gates’ famous but allegedly apocryphal statement that PCs would never need more than 640KB of Ram.



All books are fit to scan

Google caused a stir late last year when it announced plans to put millions of classic texts online – including a million from Oxford’s Bodleian Library, but how is it to be done?

The French firm I2S, which did the imaging for the CD edition of the wonderful Gutenberg Bible (detail above), demonstrated how at CeBIT.

It offers a desktop book scanner and the larger one, also pictured above, which uses air suction to turn delicate pages and can cope with sizes up to a broadsheet newspaper.

www.i2s-bookscanner.com

DrayTek Voice-over-IP Solutions

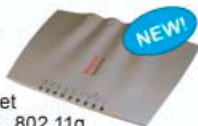
DrayTek’s award winning range of broadband routers and firewalls now supports Voice-over-IP (VoIP) facilities, enabling you to make use of your broadband line for voice calls instead of using your regular phone line.

Phone ports on the Vigor routers allow you to plug in a regular telephone and make calls to other VoIP users or, via the DrayTEL gateway, to anyone on a regular telephone line (fixed or mobile). You can receive calls too; either over the internet or via your personal DrayTEL phone number.

DrayTek Vigor routers are available for ADSL, Cable-modem and ISDN users - visit the web site to see the extensive specification of each model and select the ideal router for your own requirements.

Now available for cable-modem users, the **Vigor2100VG** is a router with VoIP, internet sharing, firewall and 802.11g Wireless LAN all at a great price, ideal for home users with NTL or Telewest broadband - check out full details of this exciting new product on our web site.

As well as VoIP, the Vigor router range has its regular feature-rich specification: The high performance firewall with URL content filtering, DoS protection, time scheduling, plug-in blocking and user-defined filtering all helps keep your network secure. Other features include virtual LAN, Ethernet port throttling, extensive reporting methods and an easy to manage user interface.

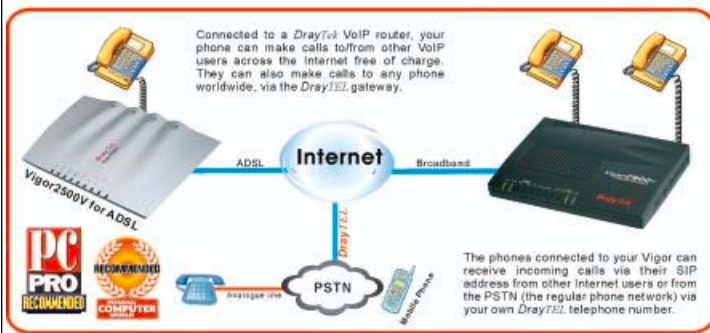


DrayTek VPN & Secure Wireless

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Specification subject to change. Facilities vary with model.



Moore and more cores

Processors are not clocking any faster as Moore's Law hits the age of 40, but they are spawning a lot of codenames. Kelvyn Taylor guides you through the multicore maze at IDF

This year's Intel Developer Forum (IDF) was themed around the 40th anniversary of Intel co-founder Gordon Moore's observations on the economics of integrated circuit manufacture – something that's been shamelessly distorted over the years by Intel into Moore's 'Law'. It took retiring Intel CEO Craig Barrett just 17 minutes to mention this corporate mantra during his opening keynote address and thereafter it was slipped in at every opportunity.

Moore's original concern was with the relationship between the history of advances in fabrication techniques, increasing transistor densities and manufacturing costs per finished component. He noticed that the optimal transistor density (in terms of manufacturing cost) in integrated circuits had doubled every couple of years. He also predicted that, based on the economic dictates of silicon fabrication, this trend would continue. In recent years, industry watchers have been worried that Intel might not be able to keep ahead of the curve, as more technical barriers are met at the tiny feature sizes required in modern chips.

The importance of Moore's prediction is that it's effectively the basis of Intel's business model – to keep manufacturing costs per unit reducing over time. Despite advances in fabrication technology and materials, it still has to find ways of doubling the transistor density every 18 months or so. Otherwise, it could find its unit manufacturing costs increasing and eating into its profits.

Intel was at great pains to demonstrate to everyone present that many of the predicted 'brick walls' of Cmos manufacturing techniques have been successfully penetrated, at least for the next 10 years or so. We heard lots about 300mm wafers, strained silicon, tri-gate

PLATFORMS		
CODENAME	USAGE	DESCRIPTION
Anchor Creek	Desktop (home)	Presler CPU, 945G/955X chipset
Lyndon	Desktop (office)	Presler CPU, 945G/955X chipset, Intel Pro/1000 Lan, Intel AMT
Napa	Mobile	Yonah dual-core CPU, Calistoga chipset, Golan wireless
PROCESSORS, CHIPSETS AND TECHNOLOGY		
CODENAME	USAGE	DESCRIPTION
Calistoga	Mobile	Mobile chipset with enhanced integrated graphics
Cedar Mill	Desktop	65nm single core desktop CPU, due first half 2006
Golan	Mobile	Mobile wireless – reduced form factor mini-card
Presler	Desktop	65nm dual-core desktop CPU, made from two Cedar Mill cores in a multi-chip package (MCP)
Smithfield	Desktop	90nm dual-core desktop CPU, branded as Pentium Extreme Edition (with HT) and Pentium D (non-HT)
Yonah	Mobile	65nm mobile dual-core CPU (non-HT), due Q106

Codename decoder... a guide to the multicore future

transistors, high-k gate dielectrics and all manner of esoteric ways of saying 'We can still build smaller transistors'.

What Intel has admitted, though, is that the gigahertz race is all but dead. With ever-smaller feature sizes in chips, power consumption becomes a major problem – although smaller and faster transistors consume less power, the increased overall transistor count and power leakage more than negates any advantage. So, making CPU clock speeds higher than about 4GHz isn't really practical with current materials and to maintain the upward trend of processing, power requires a different approach.

1+1=4

Intel has opted for the multi-core approach, whereby two or more processors are packaged together. Each processor is independent but aware of the other, and can help share the processing load via hardware and/or software. The term for this is multithreading and has long been a feature of Windows. Hyperthreading (HT) is a form of virtual multithreading that fools the operating system into believing two CPUs are available, allowing the OS to run a separate thread on each

CPU. HT is not as efficient as a true multiprocessor system, though. The dual-core parts will be differentiated by whether they have HT on each core as well – the Pentium Extreme Edition will have two HT cores (four threads), but the cheaper Pentium D will have two non-HT cores (two threads). It is something end users will need to keep an eye on.

And it gets more confusing. Some CPUs, such as the Pentium D and Pentium EE will use a single piece of silicon which contains two separate processor cores, whereas the first 65nanometer desktop part (Presler) will be two separate pieces of silicon. The method used will depend on the manufacturing cost efficiencies, according to Intel, but in theory it shouldn't matter to the user.

Core practices

By the end of this year, almost every new Intel CPU will be dual-core and over the coming years we'll see a progression to four, eight, 16 or more cores per package – what Intel calls 'many core' processors. The impact on end-user experience should be dramatic – Windows XP running a few standard applications has about 500-700 threads running at any time, so



Craig Barret shows off a novel PC form factor during his IDF speech

there's lots of scope for these to be farmed out to multiple CPUs. Of course, applications have to be coded to take advantage of the fact – some are more amenable to multithreading than others.

How this approach works economically isn't all that clear – Intel can't really charge double the price for a dual-core CPU, so its average revenue per core will presumably slip. This is balanced against the fact that 300mm wafers produce some 30 per cent more cores per wafer than 200mm wafers, but the overall equation is a tricky one. Average selling prices may be buoyed a little by the extravagantly priced Extreme Edition line, at \$1,000 or more, but these aren't mainstream volume chips. Perhaps the key lies in the ever-expanding world of mobile chips – the top-end Pentium M parts command a sizeable premium. Multicore in mobile platforms will start with the Napa variant of Centrino, using the Yonah dual-core, non-HT CPU.

It's therefore going to be a fascinating couple of years, with multicore and 64bit technologies both vying for consumers' attention. But you can rest assured that PCW will do its best to guide you through the maze.

Vanderpool is virtually here

No IDF would be complete without a raft of new acronyms and this year was no exception. The key new technologies were lumped together as the 'T*s' by Intel (to represent Technologies, plus a wildcard symbol) and consist of existing technologies, such as Hyperthreading (HT) and Extended Memory 64 Technology (EM64T) plus three new ones. Intel Active Management Technology (IAMT) is a way of managing and monitoring PCs even when they're powered off – aimed squarely at business networks.

Of most interest to end users is the Intel Virtualisation Technology (IVT) formerly codenamed Vanderpool, which adds hardware support for running virtual PCs. A virtual PC is, in effect, a complete PC

system with its own virtual hardware and operating system, running inside a host OS. Current software-based products, such as Microsoft's Virtual PC 2005, can be slow due to a large processing overhead which can be reduced significantly with virtualisation support built into the hardware. With multi-core processors helping to spread the processing load, we could all be using virtual PCs a lot more in future. IVT is expected to appear in desktop platforms later this year,

and in mobile platforms in 2006. The advantage is that the virtual PC is securely isolated from the host system – so if little Johnny formats his virtual hard disk, the rest of the family doesn't have to worry about any lost data. Of course, Johnny will need his own licensed operating system to install on his virtual PC, so OS vendors may have to come up with new licensing structures to prevent the cost of a home PC going through the roof.

Kelvyn Taylor

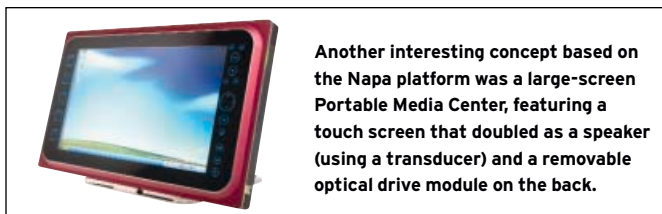


Mac Mini lookalike based on Napa PC

Despite all the crystal ball-gazing at IDF, there weren't many bold hardware concepts on show. The product that caused the biggest stir was a Mac Mini lookalike based on the next-generation dual-core Centrino platform Napa.

Finally, there was a super-slim Napa-based desktop concept. As ever, Intel doesn't intend to make any of these – they're just to give developers a flavour of what Intel believes is possible.

Kelvyn Taylor



Another interesting concept based on the Napa platform was a large-screen Portable Media Center, featuring a touch screen that doubled as a speaker (using a transducer) and a removable optical drive module on the back.

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PC performers & graphics scorchers

Below are the latest results, at the time of going to press, for the best performing graphics cards and PCs that have been through our labs. The results are dynamically updated throughout the month and if you go online you'll find expanded tables giving you more details on every product reviewed. Updated daily, the Test Bed is home to all the latest test data, products and gossip that we see and hear about in our labs. You'll find it all at www.pcw.co.uk/labs.

FASTEST GRAPHICS CARDS				
MANUFACTURER	MODEL	DOOM3	3DMARK05	3DMARK03
ASUS	Extreme N6800 Ultra (SLI)	102.8	9,541	2,1673
ASUS	Extreme N6800GT (SLI)	102.1	8,710	18,873
POWERCOLOR	X850XT Platinum Edition	91.9	6,071	13,140
SAPPHIRE	Radeon X850XT	91.4	6,066	13,145
GECUBE	Radeon X850XT	91.1	6,063	13,080

Carried out 1,024 x 768, 32bit at 75Hz

Top tens

Check out www.pcw.co.uk/labs for more performance tables:

- Top 10 performing laptops
- Top five laptops for battery life
- Top performing CD/DVD drives

FASTEST GENERAL PURPOSE PCs						
MANUFACTURER	MODEL	SYSMARK04	3DMARK05	3DMARK03	PCMARK04	REVIEW ISSUE
POWEROID	3220	233	5,816	12,606	6,714	PCW April 05
EVESHAM	Decimator	229	6,035	13,187	5,858	PCW March 05
ADVENT	T9420	214	2,941	7,312	5,361	PCW March 05
INTELLECT	Prodesk Q560V	209	2,764	7,344	5,520	PCW April 05
MESH	Fireblade SLI	202	5,815	5,815	4,308	PCW March 05

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More light on photonics

A San Francisco start-up appears to have trounced Intel in the race to build fibre optics directly into a silicon chip.

Luxtera says it has built a modulator capable of translating electronic data into photonic data at 10Gbits/sec. Intel has already achieved 4Gbits/sec with its silicon photonic modulator and claims to be on track of 10Gbits/sec.

The ability to integrate photonic links directly into silicon, capable of mass production in Cmos fabs across the world, would cut the cost and complexity of high speed networks. Intel has said its

products will not be available until the end of the decade.

'Until now, the progress in silicon photonics has been in the form of research. Luxtera is the first company to develop a complete, working product that meets a market need,' said Linley Gwennap, principal analyst at The Linley Group, a semiconductor technology analyst firm.

'I am impressed that Luxtera has accomplished this using a production Cmos process, allowing its technology to be built in Cmos fabs.'

Alex Dickinson, co-founder and chief executive of Luxtera, said: 'This development of the

world's first 10GB optical modulator in Cmos is a huge milestone for the Luxtera team and for the industry in general. This clearly signals that Cmos photonics products are just around the corner, not years into the future. We are already far along with our product development.'

However, the modulator still needs an exterior laser and one of the trickiest aspects of the technology is finding a way to connect this physically to a chip. Intel has demonstrated a silicon Raman laser that can be integrated into a chip (see www.pcw.co.uk/news/1161762).

Iain Thompson

Pre-paid ink could boost use of colour

Xerox is extending a pre-pay scheme for print consumables that could increase the use of colour in small businesses.

Deals will vary with suppliers but all involve paying a fixed sum for a certain number of pages per month – say 500 for a small office.

The idea is to give offices a fixed cost per page, which on standard deals differs enormously according to what you are printing – a photograph will clearly use more ink than text. But as the pre-pay cost is the same however much ink is used, people are likely to be less inhibited in their use of colour.

Similar schemes are run by other printer manufacturers, usually for enterprise customers. They help printer suppliers retain customers for the lucrative after-sales market in ink and paper and discourage a



The multi-function C2424 will take advantage of the solid ink cartridges

drift to cheap alternatives. Xerox launched its scheme for a limited range of models but has now extended it to other models including the new C2424, which it describes as the first multi-function printer to use solid-state ink. Pre-paid ink cartridges are chipped so they

can only be used on authorised machines. But these will also take non-prepaid consumables, allowing buyers to opt out of the scheme when their initial contract expires, said Xerox European business manager Mark Anderson at the launch of the C2424.

Xerox says this provides in one box the ability to print, copy and scan documents with the same quality as more expensive standalone models. The solid ink is easier and less messy to handle and provides a higher, more consistent, quality on a wider variety of paper than liquid inks.

It prints at up to 24 pages a minute mono and can produce a colour page in six seconds from a cold start. The C2424 lists at £1,999 ex VAT but is likely to be discounted by up to £200.

www.xerox.com

Adobe tightens Quark Xpress DTP squeeze

Adobe is continuing its squeeze on the publishing market with a major upgrade of its Creative Suite package, which includes its flagship products Photoshop, Illustrator, Acrobat and Indesign.

Creative Suite 2, reviewed on page 76, includes a new piece of 'glue' software called Adobe Bridge, a media manager that replaces the File Browser in Photoshop. The company says integration has been

improved between all the modules. This could be seen as a plus in publishing houses, where the Indesign DTP has been making inroads into the market share of dominant Quark Xpress.

Photoshop includes new features useful to picture desks, including the ability to paint out unwanted objects using background patterns and textures. Check out www.pcw.co.uk for prices.



>> 4ms LCD panel

Viewsonic has announced what it claims are the world's fastest LCD monitors with an average video response time of four milliseconds across the colour range. The 19in VX924 and 17in VX724 will be available this summer, the company says. Prices have yet to be announced.

>> 2TB drive

Lacie has introduced a £1,295 ex VAT 2TB version of Bigger Disk Extreme drive which is actually four hard drives acting as one. They are configured for Raid 0, which means data is 'striped' across the disks to provide transfer rates of up to 85Mbytes/sec.

www.lacie.com/uk

>> Anyone there?

You can beam an email message to the Milky Way by calling a £2 a minute phone line set up by a team calling themselves

www.talktoaliens.com.

They transmit messages using a 10.5m parabolic dish in Connecticut.

>> Mouse aid

An IBM-developed adapter will enable people with hand tremors to have normal use of a PC mouse. Three million people in Britain suffer from the condition – they will be able to buy the Assistive Mouse Adapter for less than £60. For more, details go to www.montrosesecam.com

>> Email info

A new add-on for Outlook and Outlook Express will tell you the country, state, city, company, service provider and IP address of each email – and even the sender's connection speed. Windows-based LocationMail costs \$29.99 (£16 approx) from www.locationmail.com



Letters

Monitoring tax >

In January 2005's issue (page 17), you had a news article about how monitors with DVI interfaces would be subject to an increase in duty.

From 1 October 2004 it would appear they have been attracting an extra 14 per cent duty because they are being classed as video monitors.

I'm sure there were plenty of readers who felt this was simply another stealth tax on new technology and I took up the issue with my local MP, Norman Baker, who has since written to the Treasury about it.

You will not be surprised that the Treasury's response wasn't exactly helpful. However, another letter and another response and they have added a comment that '...a proposal is to be submitted to the European Council to suspend duties on certain types of monitor, classified in the 14 per cent duty heading, that are most likely to be used with personal computers.'

The comment goes on to say if this goes through it is intended to make this retrospective from 1 January 2005. So how is that going to work? If you bought a monitor recently how will you claim the duty back? Will the government tell us? I'm waiting to see what develops.

Rod Main

Music licence rip offs>

It's good to see articles on digital music as it is clear this is of huge interest to us all. I am worried though about the Digital Rights Management used by music download services – or more particularly the way it is used.

I've spent a lot of money on downloaded music from MSN Music, which was great until I looked a bit more carefully at the licence details. The cost and usage of the product is severely restrictive compared to owning a CD.

For a start, there are the unfair licence conditions, such as backup licences (I can copy the music, it's just worthless without the licence), and the fact that music can only be played until

The author of the Letter of the Month will win a Logic3 I-station.

WIN!

With a powerful 12w sub-woofer and a 3D surround-sound processor, the I-station is the perfect accompaniment to Apple's Ipod. What's more, you don't have to own an Ipod to make use of these speakers since they're capable of linking up with any mp3 player. The I-station runs off either an AC adapter or four AA batteries, and will even charge your Ipod when you use it. For more information on the I-station go to www.logic3.co.uk.



2099 – fine for me but what about my children inheriting a music collection?

All I want is a way to legitimately transfer my music collection to a new device and remove it from the old one, but there doesn't appear to be a way to do this yet.

Or how about if my computer is stolen, destroyed in a fire or just plain broken –



TV tax on monitors has caused anger

Letter of the month

Fooling the ad-man's spyware>

Guy Kewney's attack on spyware ('Can Spyware come in from the cold?', PCW April 2005) sends shivers down the spine.

It is unclear from his article how far spyware goes: whether our emails are read by big business, read to build a profile of us or whether they are being read and our browser behaviour analysed so that profiles can be used to aim advertising at our soft targets.

What is clear is that it is possible. And that which is possible, is probably being done. I find this depressing. It is also depressing that most of the people Guy asks don't seem to be bothered. But most depressing of all is Guy's assertion that we are all so predictable that the ad army can gun us down with ease.

The straight and level flight of my life is read from these very keystrokes, and puts me on the adman's radar. Now let's move this around a bit: this glimpse into the abyss of predictability could be – should be – more character-building than groundhog day. Do we want to be sitting ducks for the sporting pleasure of material-mongers?

So this week I'm mostly surfing for holidays in Marbella on behalf of my orchid growing chums. Next week I shall be a Vegan motorbike rider seeking silent films that feature sitars. If I shop on the Internet it will be for stuffed kites and feather boa constrictors one day and volt-free relays the next.

I will be devious and my profile will make less sense than one painted by Picasso. From now on I am dedicating my life to glorious unpredictability.

Tim Rigley



Windows XP 64bit has been greatly delayed

suddenly I have lost my entire music collection. I wonder what the insurance company will make of a claim for hundreds of pounds of digital music?

This is copyright gone mad fuelled by the Digital Millennium Copyright Act (and we don't even live in the US). The rights of the big companies have become too great and the rights of the individual have been completely eroded. Not in the spirit of copyright law at all. The big music companies talk about theft of music through copying. This is rubbish, it is copyright infringement and should be treated as such. Just because someone takes a copy of a music track does not mean the original has been taken or lost – it is not theft and should not be treated as such.

I have no interest in duplicating/distributing copyright material or breaking the law but I do want to be able to enjoy freely what I have paid a fair price for.

Graham Parkins

Where are my missing 32bits?>

The computing industry is renowned for its rapid pace of change. So why, 13 months after unwrapping my shiny new 64bit PC, am I still confined to working at 32bits? The AMD website still refers to 64bit Windows XP being available later in 2004. What is more perplexing is the apparent lack of concern or interest over this continued delay by the industry and media.

Can you throw any light on the situation? It would be nice to use my Athlon to its full potential before it is obsolete.

Crawford Stewart

Kelvyn Taylor replies> Windows XP 64bit Edition has been severely delayed, but is finally due to appear in the next few months. We'll have a special feature on 64bit computing in our next issue.

Ad-hoc Wifi limitations>

No-one had told me, either in any reviews or going to my local computer shop, that

to get full 54Mbps/sec access on a wireless network, one of my devices has to be an access point. You can only get 11Mbps/sec between two client devices on an ad-hoc network.

Can you please print this letter for your readers to save them so much time, as I've seen so many rants on web forums with people having the same trouble.

Ian Longdon

Kelvyn Taylor replies> Thanks for pointing out a little-known fact. The IEEE 802.11 standard specifies that performance in ad-hoc (peer-to-peer) mode must achieve 11Mbps/sec, but no more, regardless of whether the adapter is 802.11b or 802.11g. There's no requirement for manufacturers to exceed the 11Mbps/sec specification and many don't. The Wifi Alliance told us that, as the standard only specifies a maximum of 11Mbps/sec performance in ad-hoc mode, testing above this speed is not performed as part of the Wifi certification procedure.

While it's arguably unfair to criticise vendors for not exceeding a standard, they don't go out of their way to let users know about this. Some products do appear to connect at higher rates in ad-hoc mode, but it's not advertised and it's a 'suck it and see' process to find out.



Many PC quirks are due to Ram problems

No thanks for the memory>

A couple of years ago I bought the Rolls Royce of PCs – the spec was about as good as it gets, but after a few weeks I couldn't fail to notice that it crashed rather a lot – the manufacturers said it was probably out of date drivers. So I downloaded and reinstalled what I could and bought some new software. It still crashed a lot – blue screens, funny code messages and random restarts.

It continually went back to the makers who checked everything and said all was well – and, every time, I had to reinstall every bit of software. After a while I gave up on the manufacturers and did some investigating myself – I discovered that it had to be the Ram. So I downloaded not

one but two Ram testers and both said the Ram was fine. I approached another company who said 'it must be the hard disk', so I got a new one but still the crashes continued.

A few months went by and I was ready to junk the whole machine – until someone said it must be the processor. So I bought a new processor – and of course it needed a new motherboard. It wasn't the processor, nor the motherboard, and the crashes continued. So I tested the Ram again, it was fine, but the crashes continued. So I bought new Ram – and the crashes stopped. Moral of the story? It was the Ram, stupid.

Don Somner

Kelvyn Taylor replies> As you've discovered, many peculiar PC problems can be caused by defective or incompatible memory. Software memory testers won't usually pick up the sort of problems you experienced – it's always best wherever possible to insist on well-known brands of memory that have some form of manufacturer's warranty.

Green blues>

Where on earth did you find this Simon Crisp (April, p53)? Don't you think we suffer enough whingeing from the green fringe without PCW adding to the volume?

So he's worried about 'arsenic, zinc, lead and cadmium' being released into the environment? Where does he think they came from? They are metallic elements which were extracted from the environment and, when we don't need them any more, we can't destroy them; we can only return them to the, er, environment.

If he wants to do something really valuable for the environment, he could return whence he came and make PCW one page thinner.

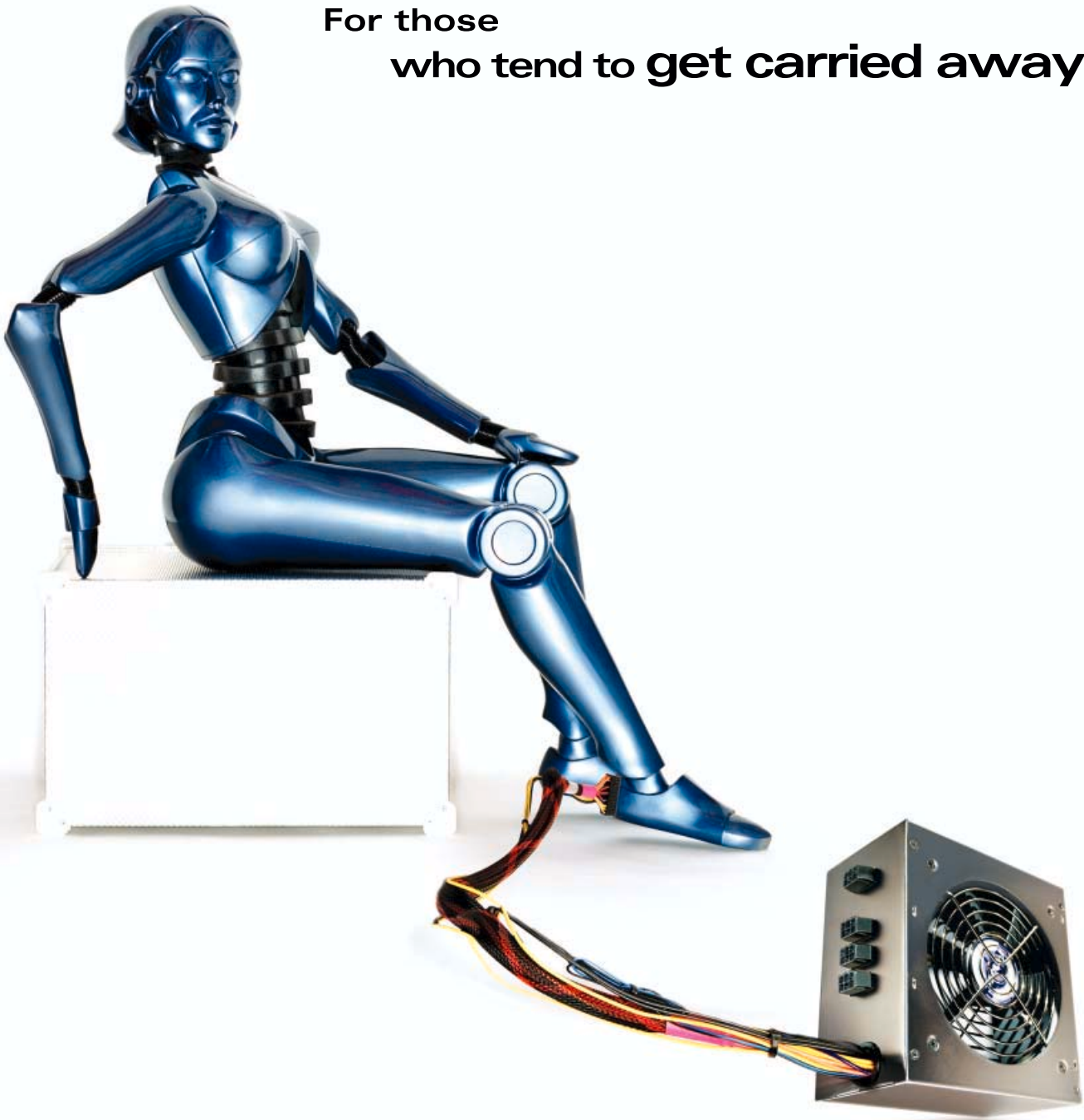
John French

Simon Crisp replies> You're either missing the point or being deliberately obtuse. The problem with the elements mentioned is not their existence, which we can do little about, but their artificially increased concentrations in manufactured products.

High concentrations of toxic materials caused by dumping of IT waste in landfills is a very serious problem, especially if groundwater becomes contaminated.

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who tend to get carried away



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gordonl@pcw.co.uk

Small details hide the bigger picture

Gordon Laing welcomes the imminent launch of high definition TV, but wonders if we will be able to view it?

When Sky announced it would begin high definition (HD) TV broadcasts in 2006 there was a collective sigh of relief from UK home cinema enthusiasts. Because, unless you count the single satellite channel on Euro1080, or the handful of Windows Media Video HD (WMV-HD) DVDs, the UK is bereft of high definition content. Ironic, considering some of the best HD content is actually produced here by the BBC and exported to countries with more forward-thinking broadcasters.

But before I start grinding my teeth, at least Sky has committed to HD. We don't yet know the exact dates, prices or actual content, but it's a step in the right direction. Then there's the imminent prospect of pre-recorded HD movies delivered on optical disc, be it Blu-Ray, HD-DVD or a last-minute alliance between the two rival camps. And completing the picture, literally, are the increasing number of HD-ready TVs on sale. Yes it's taken some time to get here, but it finally looks like HD is just round the corner for the UK.

But there's already trouble in paradise. If, like me, you carefully chose your last TV so it could handle HD video in the future, you might be in for a nasty shock.

In the old days, the only requirement for displaying HD video was simply a screen with sufficient bandwidth to handle the signal and enough pixels to show it. No problem I thought, when investing my savings on a projector several years ago – I'll simply get one that can handle the 720P and 1080i HD standards and be set for life.

Wrong. My Sony W10 projector may have boasted support for HD video standards when I bought it, but like every display of the age, it did so with analogue component or RGB inputs. It now looks like forthcoming HD sources will only output HD video on secured digital outputs, effectively rendering displays with only analogue inputs redundant – for viewing HD anyway.

But before anyone with a digital input on their display breathes a sigh of relief, they'd better check their specifications. Forthcoming HD sources may feature DVI, or electrically-compatible HDMI outputs, but they'll also employ High-bandwidth Digital Content Protection (HDCP).

If you connect an HDCP source to a display, which doesn't support HDCP, you will, at best, only see a down-converted standard definition picture or, at worst, nothing at all. And before HDCP became prevalent there were plenty of displays sold with unprotected DVI ports.

The message for buyers of new 'HD-ready' TVs is to ensure they also support HDCP, whether over a DVI or HDMI connector. As for anyone who bought a high resolution display without HDCP or, indeed, any digital inputs at all, the horrifying reality is you may not see much, or any, HD content at all.

There is light at the end of the tunnel, though. After initially stating its forthcoming HD service would demand a display with HDCP, Sky has relented and confirmed its first HD set-top box would also include analogue component video outputs. Hopefully, HD optical disc players will also feature analogue component outputs, which aren't hobbled to only deliver standard definition video.

It's a worrying situation, but what's it got to do with PCs? Well, an increasing number are already being used as sources of video and, as this switches to include more high definition content, HDCP will come into play. HDCP-equipped graphics cards are already in the pipeline, and there's rumours the next version of Windows Media Center will demand HDCP hardware. But how many DVI-equipped PC displays also support HDCP? While a number of the latest models do, a considerable number of existing ones do not. So does this mean once PCs employ HDCP, we'll all need to buy new monitors too? Yes and no. If your PC has HDCP and your monitor doesn't, then you should still be able to view normal desktop applications. The difference is when you want to watch protected content, HD or otherwise –

then you'll probably need an HDCP-equipped monitor.

You may be tempted to bypass the whole world of HDCP by fitting a forthcoming Blu-Ray or HD-DVD drive in your PC and outputting the HD video over the analogue VGA port to an unprotected display, but it's unlikely to work. The implementation of HD video on PC drives is not yet finalised, but again it's likely to be a situation where the analogue output will only show down-converted standard definition video. If you want to see HD, you'll almost certainly need an HDCP digital link.

It is infuriating to invest in a decent high resolution display, whether TV, plasma, projector or PC monitor, only to discover you may never be able to watch HD content on it. But short of boycotting devices and services, which demand HDCP, there's little early adopters can do. All I can say is, if you're in the market for a new display and intend to watch HD video on it, avoid anything which doesn't have an HDCP, DVI or HDMI ports – this particularly applies to older discounted screens which may not be the bargains they first appear. ■

'If you chose your last TV so it could handle HD video in the future, you might be in for a nasty shock'



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Robots don't need the human touch

Intelligent robots are still a long way off, argues Guy Kewney, unless they learn to think for themselves

Meccano was what kids used to use to make their own machines. These days, we need machines that reflect the age in the way Meccano reflected the Victorian engineering of their time; they must be intelligent. The trouble with 'intelligent' animated beings – robots, if you prefer – is that they really are not at all intelligent. The problem isn't sensors, actuators and servos – it's language.

MacPhee (a character in a 1950s novel by CS Lewis) remarked on the difficulty of getting men to program women and vice versa: 'The cardinal difficulty in collaboration between the sexes, is that women speak a language without nouns,' he noted, pedantically. 'If two men are working in the kitchen, one may say to the other: 'Put this bowl in the bigger bowl which you'll find on the top shelf of the wooden cupboard.' A woman will say: 'Put this in the other one in there.'"

That's talking to humans with different cultural expectations – men and women in the 1950s had very different cultural backgrounds.

Most of the robots you see on TV are actually remote-controlled tools, operated wirelessly by a human. Learning to operate them is a skill similar to learning the violin – you can't do it by shouting at the embattled machine: 'Hit him, hit him harder!'

Radio Shack, in the US, is jumping into the 'home robot' market with its Vex robot kit. Astonishingly cheap, at less than £200 for a kit of parts, including radio controller, nuts, bolts, bars and flanges – more than 500 components which you can build into your robot – and it will sit there, sulking.

Which is pretty much what human robots do. Such misunderstandings are the meat and drink of sitcom writers, people giving ambiguous instructions to underlings and then ranting at them for failing to intuit what 'put the other one in there' means.

Programming robots isn't just a skill, it's an exercise in linguistics. I'm not thinking of simple, one-function remote-controlled sensors like the endoscope earthworm (www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=15764374&dopt=Abstract) for detecting bowel cancer. I'm thinking of something which, given 100 years of careful evolution, might end up even slightly like the animated super-androids of the movie *I, Robot*.

In our office, there is a robot. It holds snacks. If you give it money and tell it what you want from its range of snacks, it will ungraciously go through the motions of

pretending to dispense the snack you specified. Then it will sneakily snag the snack with the end of its hook, dispense the wrong change and then cease operations, with a smug expression, which is pure insubordination.

Not much like an Asimov robot at all, except for the way it matches a crucial plot device of the movie (but not the original book) – which is the cunning way the central robot pretends to misunderstand its orders, to suit its own purpose.

As anybody who has ever written even the most trivial program knows, this is the basic nature of software: to find ways of disobeying orders – but ways that nonetheless clearly follow instructions to the letter of the law.

And yet, despite pouring all this heavy scorn on the idea of programming autonomous robots, I'll admit to delight at seeing this extension to the personal computer. We already have the Lego robot building-blocks, of course – the Radio Shack devices look as if they appeal directly to the Meccano brat in us all. The bits of metal with holes in them for the nuts and bolts, the wheels, the motors, all ready to do what you want with them, rather than what a toy maker decided you should be limited to.

If the giant engineering projects of the last century were put together by grown-up kids who wanted a bigger Meccano set, then I think it's likely that the cybernetic enhancements of this century will be put together by adult toy-builders who cut their teeth on the Lego blocks and then moved on to build more complex devices out of the RS Vex.

Because at the end of the day, robots as autonomous substitutes for people are not what it's about. It's about extending the reach of our human hands with genuinely intelligent peripherals.

That's a real challenge and one which civilisation will need to meet if it is to survive in a future where raw materials become impossible to obtain except in hostile environments. Robots in the asteroid belt can't be directed by remote control – by the time you've corrected the error you can see them about to make, it will be too late. They have to have their own eyes and their own decision-making abilities.

What we need is a generation of adults who cut their teeth on the concepts of intelligent tools, kids who learned – practically, not theoretically – just how perverse a servant can be if you leave room for misunderstanding.

Vex may be a 'toy', but it's an exciting one and every overgrown child will want to plug it into their PC to experiment with. I just hope the frustrations of the first experiments don't lead to too many bent trunnions. ■

'At the end of the day, robots as autonomous substitutes for people are not what it's about'

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Don't lose sight of users' needs

The IT industry is out of touch with what customers want, says Barry Fox, and doesn't know what to do about it

The pre-event blurb looked hopeful. The mobile phone industry was finally owning up to the fact that once again it had launched a system before it was ready. Cellnet/O2 famously did it with Wap, which was launched as mobile Internet access, but was nothing of the kind. Now, all the mobile networks are giving away MMS picture phones like bags of sweets, but few people can make them work and even fewer want to spend high rates on sending picture messages.

The 'Medium is in the Message' seminar hosted by Mike Short, chairman of the Mobile Data Association and vice president of O2, boasted Hugh Griffiths, O2's Voice & Data director, on the panel of experts.

'New data services such as MMS, have, by and large, been ignored... what do consumers want?' asked the invite.

By nice coincidence, the invite arrived soon after I had engaged in a long and largely fruitless correspondence with O2's chief executive, Peter Erskine. I'd been trying to tell him how far out to sea his technical advisers were.

I had intended to spend money with O2 by using my GPRS cellphone as a mobile modem to let my laptop connect to the Internet. It worked on the Orange network with a pre-pay Sim – even from abroad, but on the O2 network my pre-pay Sim would connect only to a Wap site, which did not give access to the Internet. O2's technical advice team kept telling me GPRS data access was possible, if I just got my phone settings right.

After at least a dozen emails to and from O2's help desk, I asked Peter Erskine whether he – and O2 shareholders – realised how much money O2 was losing by denying customers access to money-spinning Internet access. Erskine was clearly equally at sea over the difference between limited Wap and full Internet access, but finally got someone to explain it to him and confirmed that 'Pay and Go customers do not yet have the facility to access the GPRS service.

'We pride ourselves on the technology and services we have available to our customers – your comments will be passed to the relevant area to help improve this service to all our customers'. And then I got the 'Dog and Pony' seminar invite.

At the seminar, Big Data boss, Hugh Griffiths, admitted frankly: 'We have to think about what customers want, and deliver that in a way that is easy, simple to understand and simple to operate.'

So I asked the obvious question. Why doesn't O2 let paying customers pay to use GPRS data?

Griffiths gave an unequivocal answer: 'O2 does support GPRS data for Prepay customers'. After the meeting, Mike Short said he thought Griffiths was correct.

After challenging this, I got a phone call from Hugh Griffiths who, very decently, apologised. He had not intended to mislead the seminar, but now realised he had been wrong. I insisted on having it in writing: 'Following my recent comment to you "O2 does support GPRS data for Prepay customers", I can confirm that this refers to Wap traffic only... a GPRS data service enabling the handset to be used as a modem for a laptop... is not available on Prepay handsets... and we have no fix on the date for the delivery.'

So once again we have a clear example of highly-paid, high-level decision makers in the IT industry being out of touch with the issues that paying customers face.

Every week some new survey highlights the public's horrifying ignorance of the risks of virus, worm and spyware infection.

I recently went to a Toshiba event to launch new laptops. While no-one was looking – or seemed to care – I dug inside the setup menus and used the open Wifi Internet connection to check their status.

One laptop needed eight high priority Windows updates and five optional updates. Norton Anti-Virus was installed but had not even been activated. Another laptop needed one high priority update and four optionals. Norton Anti-Virus was working, but was out of date, needing eight big updates. A third PC needed only four optional Windows updates, but was flagging the warning 'Virus definition database out of date'.

If PC companies don't bother to protect against them, is it any wonder the public doesn't take viruses seriously?

Philips recently announced a clever new display screen for a PDA. When not in use, the Polymer Vision screen rolls up to save space.

The key technology comes from US company E Ink. Positive and negative charges are used to make tiny white and black particles move and create visible marks. But when I tried to write about it, I realised that the technical description on E Ink's website seemed to have the vital description of negative and positive, black and white, the wrong way round (www.eink.com/technology/index.html).

So I asked Philips about it and received confirmation that I was right. A week later, the E Ink website remained uncorrected. If the companies cannot get a vital description of their key technology right, who can? ■

'Decision makers in the IT industry are out of touch with the issues that paying customers face'



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Reviews

EDITED BY CHRIS CAIN

EXCELLENT ★★★★★ VERY GOOD ★★★★★ GOOD ★★★★★ BELOW AVERAGE ★★★★★ POOR ★★★★★

Contents

Mini round-ups

- 54 Portable media players
- 66 Power protection

Hardware

- 51 Evesham Teramedia
- 52 Packard Bell Ixtreme Gold 2104 Media Center

Peripherals

- 60 Canon Pixma IP5000
 - Apple Ipod Photo
- 62 Plextor Convertx PVR
 - Fujifilm Finepix F455 Zoom
- 64 JVC Everio GZ-MC200
 - Optoma EP739
- 68 Apple Ipod Mini
 - Shuttle XP17 Temp AR
 - HP DVD 640i
 - Belkin USB2 3-port hub & 15-in-1 Media Reader/Writer
- 69 Sony Cybershot DSC-T33
 - Pentax OptioWP

Components

- 70 ECS 915-A
 - Sparkle Geforce 6200 TC

Overclocking

- 72 HIS Radeon X850XT
 - Platinum Edition IceQII
 - Gecube Radeon X800XL
 - Aerocool Coolpanel multi-function panel
 - CoolerMaster Real Power RS450-ACLY
- 73 Silentmaxx Watercooled 450W PSU
 - Enermax CS10068
 - Tagan TG480-U22
 - Small drive adapters

Software

- 74 Apple Iwork 05
- 76 Adobe Creative Suite 2 (Beta)
- 81 Kaspersky Security Suite 1
 - F-Secure Security 2005
- 82 Xara3D 6
 - Roxio Backup My PC Deluxe 6
- 85 Zinio Reader 3
 - Directory Opus 8
 - Ciphire Mail
 - Rootsmagic 2 UK
 - Platinum Edition



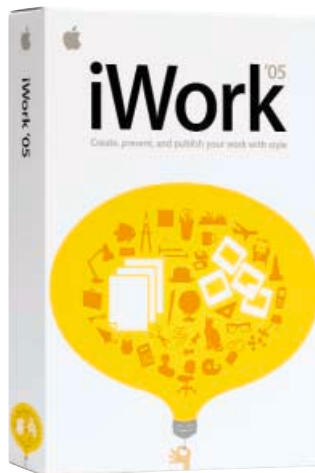
PAGE 60

1picolitre ink droplets make for impressive quality from Canon's Pixma IP5000



PAGE 54

If you're in the market for a portable media player, check out our round-up



PAGE 74

Apple Iwork is a package for Mac users who don't need the power of Microsoft Office

This month has seen something of a media frenzy at PCW, with desktop PCs, peripherals, software and portable systems all designed to make the most of video and audio files. When it comes to multimedia, not everyone shares the same vision and there are just as many custom solutions as Windows-based devices.



Leading the way is Evesham's Teramedia PC – a beast of a machine in more ways than one. This Windows Media Center 2005 system comes with more than a terabyte of hard disk space, enough to store well over a month's worth of high-quality TV recordings. There's also plenty of space for your music, digital photos, applications and games. However, at £3,000, this really is only for hardcore digital media fans with the money to match their enthusiasm.

Packard Bell is offering a more affordable alternative in the shape of the Ixtreme Gold 2104. While it only has 400GB of disk space, it does provide both analogue and digital TV tuners, a speedy 3.2GHz Pentium 4 and a dual-layer DVD writer. It also comes with an excellent software bundle to get you started straight away, all for £1,199.

This said, we were probably more excited by the latest portable media players. Our round-up shows just how much the market has expanded and the huge range of devices now on offer. Turn to page 54 to find the best way to play movies and other media files on the move.

Other hardware on test this month includes Apple's Ipod Photo and updated Ipod mini, Shuttle's latest screen, plus the next generation of Plextor's Convertx. There's the latest digital cameras including an impressive waterproof model from Pentax, and we look at the first Canon Pixma printer to arrive in our Labs. Serial upgraders and those looking to tweak their PCs performance should head over to our Overclocking and Components sections, starting on page 70. We were very taken with the new ECS 915-A – an Intel-based motherboard with PCI Express, AGP and integrated graphics support.

In the software reviews is the next edition of Adobe's Creative Suite, which offers new versions of industry staples including Indesign, Photoshop, Illustrator, and Golive, combined with the new Adobe Bridge. Plus Roxio is making it easier to keep your files safe with Backup My PC Deluxe 6, while F-Secure and Kaspersky have new Internet security solutions for home users.



Pentax OptioWP

A stylish, compact digital camera that's also waterproof. See full review, page 69



ECS 915-A

The latest technology at a great price – see page 70



DESKTOP PC

Evesham Teramedia

An ultra-powerful home television server, but at a steep price



Evesham's latest system is so new that when it arrived at *PCW* it didn't even have a name. The company sent an email to us asking for suggestions. A few seconds later, the Teramedia was born.

The Teramedia shares a case with the Decimator (reviewed in March's *PCW*) but, unlike that system, it is aimed at the Media Center market rather than gamers. It has a pair of digital TV tuners and a Raid array, consisting of three 400GB hard disks, that provides a huge 1.2TB of storage (excluding a separate 250GB Maxtor system drive).

At the heart of the system is a Pentium 4 660, clocked at 3.6GHz, complemented by an MSI i925XE motherboard and 1GB of dual-channel memory.

The Teramedia's ATI X850XT Platinum Edition graphics can handle even Half-Life 2 at high levels of detail without too much difficulty. It also managed a respectable 58fps in Far Cry and an excellent 4,145 in 3Dmark2005. However, the machine's Sysmark score of 200 was a little less than we expected from such a highly specified PC.

The Teramedia comes with Media Center 2005, making it easy to watch and record TV, play DVDs and listen to music. The dual TV tuners are designed for Freeview and let you record one show while watching another or record two programmes.

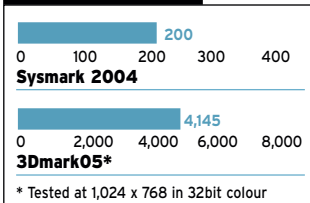
With mpeg2 compression, the Teramedia's big storage capacity means you could record around a month's worth of television

without running out of space. With better compression, such as DivX, this increases.

Interestingly, the three Seagate Sata drives are stacked together in a Raid 0 configuration (striped), without fault tolerance. This gives you the best performance but it's important to note that, should one of the drives fail, you stand to lose some of the data.

To back up recordings, you get a Sony dual-layer DVD burner

PERFORMANCE



and there's a separate DVD drive. The front also houses a 7-in-1 memory card reader, which can be ejected from the case and used as a standalone product, and a floppy disk drive. While the latter may seem redundant on a system such as this, it's needed for the Raid configuration software.

The system sports a pair of USB sockets under a flap on the top of the case, with a headphone socket, microphone socket and Firewire port. At the back are four more USB connectors and another Firewire port, plus serial, parallel, keyboard and mouse ports. For external communication, there's a 56K modem and two network ports on the front panel, should you need to use the PC as a router.

A Viewsonic 19in flat-screen TFT and set of Creative surround speakers complement all this rather well.

Although a touch noisier than traditional AV kit, this PC wouldn't look out of place in the living room, at least for those who have brushed metal silver TVs and VCRs. However, it would work very well as a home media server that can be positioned elsewhere.

Anthony Dhanendran

DETAILS

RRP £2,818.83 (£2,399 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Evesham 0870 160 9500

www.evesham.com

SPECIFICATIONS

Windows XP MCE 2005 • P4 660 (3.6GHz) • 1GB of DDR2 Ram • 250GB hard disk + 1.2TB Raid array • Dual Sony optical drives • ATI X850XT PE 256MB • Viewsonic VX912 19in TFT • 7-in-1 memory card reader • Digital TV tuners • 2x Ethernet, modem, 802.11g • WinDVD, E-Trust Anti-virus • 2yr on-site warranty, 3rd yr return-to-base

PROS Storage; two TV tuners

CONS Performance isn't amazing

VERDICT

Interesting idea, but expensive

FEATURES



PERFORMANCE



VALUE FOR MONEY



OVERALL





MULTIMEDIA PC

Packard Bell Xtreme Gold 2104 Media Center

Fully-featured Windows Media Center PC with software to match



Packard Bell continues to be the ambassador of the home PC package, combining the kind of hardware suited to the general PC user with a good selection of software. The Xtreme Gold is its latest system for those looking to take advantage of Microsoft's Windows Media Center.

Beneath the black and silver plastic exterior is an Intel Pentium 4 540 processor, running at a clock speed of 3.2GHz. Supporting this is a 1GB of DDR Ram and there are two memory slots free for future upgrades. Despite the potential power of the system, it yielded moderate results in our tests – it failed to run Sysmark, but achieved 4,797 in PC Mark 2004.

The 256MB ATI X600 Pro graphics card has plenty of dedicated memory for 3D games and will certainly run today's popular games at a respectable

resolution. Its 3Dmark 05 score of 1,354 supports this, but don't expect to run the latest titles with all the high-end visual trimmings switched on.

On the storage side, two 200GB SATA drives provide plenty of space for digital music, pictures and recorded TV shows, as well as applications and documents, although 6GB is automatically allocated for system recovery files.

Where Windows Media Center is concerned, the Xtreme Gold 2104 works fairly well, encompassing all the usual features and displaying a good TV picture using a dual digital/analogue tuner. The lack of a DVI connection on the accompanying 17in TFT monitor or graphics card is a shame, but there is an S-video output for connecting the PC to a television. A set of Veloce Storm 2.1 speakers is included,

but the Xtreme includes support for 5.1 audio.

There are Media Center shortcut buttons on the front of the case too, but we're not sure what purpose they serve – the supplied remote control is a much easier input device.

TV shows can be archived to disc using the dual-layer recordable DVD drive and there's an additional DVD player thrown in for disc-to-disc copying. All the usual ports and sockets are dotted around the front and back of the case, including a 9-in-1 memory card

reader. However, there's no room for additional hardware inside the case as all the slots and bays are occupied.

A wireless keyboard and optical mouse set complete things on the hardware front, doing away with unnecessary and unsightly cables.

Of course, no PC is complete without software and Packard Bell bundles an excellent range of titles to get you started. Along with Windows and various multimedia utilities, including Roxio's Record Now, Cyberlink PowerDVD and Steinberg My MP3 Pro SE, the Xtreme comes with Microsoft Word 2002 and Works 7 to take care of general productivity needs.

You also get PhotoImpact XL SE for creating and enhancing digital still images and a copy of Pinnacle Studio 9 Quickstart for editing digital video. Finally, Norton Internet Security FE 2004 is installed to keep you protected online.

The Xtreme Gold 2104 comes with a one-year on site warranty.

Luke Peters

DETAILS

RRP £1,199 (£1,020.42 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Packard Bell 0870 112 2334

www.packardbell.co.uk

SPECIFICATIONS

Intel Pentium 4 540 (3.2GHz) • 1,024MB of DDR Ram • 400GB SATA hard disk • DVD-RW (multi-format/multi-layer) • DVD-R • 256MB ATI X600 PRO graphics • 17in TFT • TV tuner (digital/analogue) • 9-in-1 multimedia card reader • One-year warranty • Windows Media Center **PROS** Digital and analogue TV tuners; hard disk; good value **CONS** Lack of DVI; 3D graphics

VERDICT

A pretty good Windows Media Center for the price, but don't expect earth-shattering power

FEATURES



PERFORMANCE



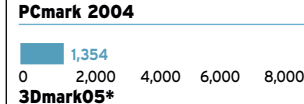
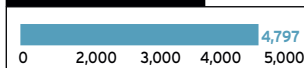
VALUE FOR MONEY



OVERALL



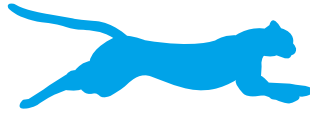
PERFORMANCE



* Tested at 1,024 x 768 in 32bit colour



27mph



64mph



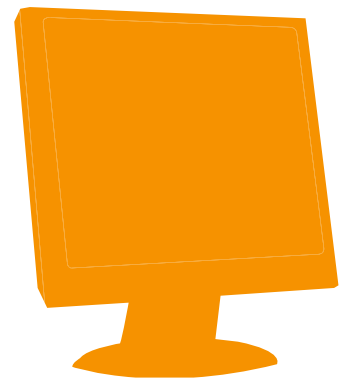
185mph



1875mph



2045mph



10msec



The **ProLite E435S** delivers uninhibited viewing of rapid DVD and video applications, made possible by newly developed liquid crystal technology that generates a market leading 10msec response time. Visit the iiyama website for more information and to enter a free prize draw.

17" LCD | 1280 x 1024
DVI-D & VGA | 350:1 contrast
350 cd/m² | sRGB

iiyama
excellence displayed.

Portable media players

Although the idea of portable media players has been around for some time, it wasn't until Microsoft released its Portable Media Center (PMC) specification last year that things really started to take off. Leading manufacturers such as Creative, Samsung and Iriver all developed these devices and, in the main, they were well received.

The big drawback with PMCs is Microsoft's insistence that they all use Windows Media Player to transfer the video and audio from your PC. Furthermore, it's not possible to record video direct into the portable player - again, Media Player must be used.

As you might expect, there are now plenty of alternatives to Microsoft's idea and over the next few pages we'll show you how they compare. We'll also take a look at how it's possible to watch movies and TV clips on some of the latest mobile phones - it's a fiddly process, but well worth the effort.

Video conversion

As you'll find out from our reviews, format compatibility, especially video formats, is something that's really holding portable media players back. The problem is there's a wide range of video formats and, within each format, various encoding options. If you decide to buy one of these players, at some point you'll come across a file it can't play, despite it being listed in the specification as a supported format. More often than not, this is down to the file having too high a resolution or an unsupported audio track, such as ac3 or mp3 VBR. There are ways around this, such as using a third-party conversion tool such as Dr DivX to re-encode the file, but it's not always an easy task.



Archos AV400

An excellent alternative to Microsoft's vision, the AV400 is much more than just an audio, video and image playback device. Not only does it let you record video directly on to the internal hard disk, it can also function as a PVR (personal video recorder).

Using the supplied docking station and IR blaster, which attaches to your set-top box's infra-red receiver, the AV400 is able to switch channels whenever a recording is due - much like Windows Media Center PCs. To enhance the PVR side of things, a remote control is also shipped as standard and the AV400 will link up to Yahoo to provide TV listings. With a total of eight wires attached to it, the docking station looks a little clumsy, but it does mean you get composite, S-video and scart connection options.

Although, like most of the other players, the AV400 only records in the mpeg4 SP (simple profile) format, it's able to play back DivX, Xvid and avi files. Wmv isn't supported as standard but, as with other unsupported formats, you can use the bundled software to convert files. In tests we found the video conversion

process to be very hit and miss and would recommend purchasing a copy of Dr DivX (www.divx.com) instead. Audio can be recorded to wav files using either the built-in microphone or line-in socket.

The review model we received had a 20GB hard drive but, if you're willing to spend a bit more, 40GB, 80GB and even 100GB models are available. As with many of the other devices on test here, the AV400 sports a memory card slot. This lets you transfer data to and from a Compact Flash Type I card.

With the portable media player market gathering pace, the Archos AV400 manages to offer more than the competition in terms of features. Our only major concern is that some supposedly supported formats refused to play and required extra conversion using third-party tools. Hopefully this will be sorted via a future firmware update.

OVERALL: ★★★★★



Archos Gmini 400

The Gmini 400 is a scaled down version of the AV400. To make a more compact device, Archos has reduced the screen to 2.2in and removed other bulky additions such as the internal speaker. The operating system remains similar, but the buttons don't have such a solid feel.

Playback support is the same as the AV400, so you'll find that some files are supported but others require a bit of conversion work before they'll be accepted.

Unsurprisingly, there's no cradle or PVR-style features – in fact, the Gmini 400 doesn't support video recording of any kind. If you want to get TV shows on to it, you'll need to get a TV capture card for your PC. However, it can record audio in the wav format.

What impressed us so much about the Gmini 400 is its sheer portability. Despite housing a huge array of features, it's by far the lightest and smallest portable media player on test. Sure, the screen is also tiny, but if you want to watch a movie while on a commute it's perfect. Battery life is also commendable, with up to five hours of video playback.

OVERALL: ★★★★★



Iriver PMP-140

The Iriver PMP-140 has a neat looking design which also includes a flip-out stand. Various controls lie down either side of the case, but menu navigation isn't intuitive and we frequently got lost.

Like the Microsoft PMC devices, the Iriver PMP-140 can't record video. A line-in socket and internal microphone allow you to record audio directly to mp3, but disappointingly you can't record from the built-in FM radio.

Two USB ports grace the left side of the unit. One is used to hook the Iriver up to your PC, while the other will connect it directly to another USB device for quick data transfer.

The Iriver supports a variety of video files, including Xvid, DivX and asf, and the conversion software included in the package allows you to play other formats, but wmv files are not supported. Given the volume of people using Windows Media Player, it's surprising Iriver hasn't included this.

Once you've mastered the fiddly controls the PMP-140 works well, but given the price we feel there are better options available with a wider variety of features.

OVERALL: ★★★★★



Hauppauge Pvmp / Mobinote DVX-Pod7010

The Hauppauge and Mobinote share more than just a similar design – they're the same product (hence the dual review). Hauppauge has jazzed up the chassis design by adding grip pads and its logo, while Mobinote has added an attractive background to the main menu screen. Performance-wise, there's nothing to differentiate them.

If you want a device that fits in your pocket, you'll have to discount these two. A portable media player with a 7in display can't be considered pocket-sized. If you can cope with the large dimensions, the widescreen display performs well and is great for watching movies.

There's no support for mpeg1/2 files, but both devices can play DivX files along with wmv files. Video can be recorded in mpeg4 SP format, but you can't schedule recordings.

If you want a portable media player with a big screen, either of these are worth considering, but they're probably too bulky for most.

OVERALL: ★★★★★



Samsung Yepp YH-999

Samsung's Yepp YH-999 is one of just a handful of Microsoft PMC devices, which all use the same operating system based on the Microsoft Media Center interface. You can read more about how it works in our original Creative Zen PMC review at www.pcw.co.uk/products/hardware/1159011.

The Yepp YH-999 isn't as bulky as the Creative Zen, and it sports a slightly smaller screen. The usual array of controls grace the front of the silver casing and, for easy viewing, a small stand flips out from the back of the unit.

Being a Microsoft-based device, the Yepp can't record directly from a video source. All data must be downloaded to system using Windows Media Player. It's a pain, but it does have the advantage that the program will automatically convert all video to wmv format. Regardless of the format your video files are in, if Windows Media Player can play it you'll be able to send it to the Yepp YH-999.

Battery life isn't great, which isn't surprising given the size of the unit, and you'll be lucky to get anything more than three hours when watching video. The inability to record directly and the reliance on Media Player will dissuade those looking for a flexible device.

OVERALL: ★★★★★



Creative Zen PMC

When we had an exclusive first look at Creative's Zen PMC back in July last year (www.pcw.co.uk/products/hardware/1156899), we were impressed. It was the first Microsoft PMC on the market and had been very well implemented. Now, less than a year later, the Creative Zen is already looking dated and rather bulky. With devices such as the Archos AV400 offering more far more in terms of features, including video and audio recording, at a cheaper price, Creative would do well to develop a non-Microsoft alternative.

OVERALL: ★★★★★



Iriver PMC-120

There's no mistaking that this is another Iriver product, but this time the company has gone down the Microsoft route. The interface is incredibly easy to use and video compatibility is solved since all video has to be encoded to wmv and transferred using Windows Media Player. But the fact remains that it's simply not as versatile as other devices. If you're not bothered about losing out on features, the Iriver PMC-120 is worth a look, but it's also one of the more expensive Portable Media Centers.

OVERALL: ★★★★★



MSI Megaview 566

MSI's Megaview 566 is a lightweight portable media player that comes in a fair bit cheaper than the competition. It supports a wide variety of audio, video and image formats and will happily record direct from a video source.

The display on our review model was a little disappointing, since the honeycomb effect of the LCD screen was clearly visible – something that the other players managed to avoid. You can read a full review of the MSI Megaview 566 at

www.pcw.co.uk/products/hardware/1162294

OVERALL: ★★★★★

MANUFACTURER	ARCHOS	ARCHOS	CREATIVE	HAUPPAUGE	IRIVER
MODEL	AV400	GMINI 400	ZEN PMC	PMVP	PMC-120
Price (ex VAT)	£314.99 (€268.07)	£239.99 (€204.24)	£369.99 (€314.89)	£399 (€339.57)	£400 (340.43)
Sales telephone	0870 770 0848	0870 770 0848	N/A	020 7378 1997	N/A
URL	www.datamind.co.uk	www.datamind.co.uk	http://europe.creative.com	www.hauppage.co.uk	www.iriver.com
SPECIFICATIONS					
Size	3.5in	2.2in	3.8in	7in	3.5in
Hard disk	20GB	20GB	20GB	20GB	20GB
Expansion slots	Compact Flash Type I	Compact Flash Type I	N/A	N/A	N/A
PLAYBACK					
FM Tuner	Optional	Optional	×	×	×
Video formats	mpeg4 SP, avi, DivX, Xvid	mpeg4 SP, avi, DivX, Xvid	wmv*	wmv, Quicktime, DivX	wmv*
Video recording	mpeg4 SP	N/A	N/A	mpeg4 SP	N/A
Audio formats	mp3, wma, wav	mp3, wma, wav	mp3, wma	mp3, wma	mp3, wma
Audio recording	wav	wav	N/A	mp3	N/A
Image formats	jpg, bmp	jpg, bmp	jpg	jpg, bmp, gif	jpg
NTSC/Pal	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
AUDIO					
Speakers	Mono	N/A	Mono	N/A	Mono
Microphone	✓	✓	×	×	×
OTHER					
Remote control	✓	Optional	×	×	×
Interface	USB2	USB2	USB2	USB2	USB2
Power source	Li-ion battery	Li-ion battery	Li-ion battery	Li-ion battery	Li-ion battery
Quoted video/audio battery life (hours)	4/12	5/10	7/22	2/3	5/14
Dimensions (w x h x d mm)	125 x 78 x 20	106 x 60 x 17	144 x 80 x 27	192 x 115 x 28	140 x 84 x 30
Weight	280g	160g	340g	570g	260g
SCORES					
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

*Windows Media Player will automatically convert video to wmv format



Mustek PVR-H140

In a cumbersome and altogether unattractive casing, the Mustek PVR-H140 certainly won't appeal to the style-conscious. Wmv video playback is omitted, but it can handle mpeg1, asf and avi formats. The PVR-H140 can also record mpeg4 SP files.

As with many other Mustek products, the big draw for this portable media player is the price. At £269, it's very competitive, especially considering the 40GB capacity. That said, unwieldy controls, a poor interface and a sluggish one minute boot routine hold it back.

OVERALL: ★★★★★



PQI Mpack P800

The PQI Mpack P800 is another media player that suffers from a poor design. Controlling the device using the two joypads on either side of the case requires a large amount of guesswork and just a bit of luck. Even after extensive testing we were never comfortable with the controls. Where the Mpack P800 really excels is with its audio and video format support. Mpeg1/2/4, wmv, avi, xvid and asf are among those catered for while the usual audio formats are backed up by ac3 and ogg (Ogg Vorbis) playback. Despite the 40GB hard drive, we feel it's expensive.

OVERALL: ★★★★★

The winners

Portable media players are still in their infancy. Early adopters are clambering over themselves to get the latest models, but the majority of consumers appear cautious. So, is the time right to bite the bullet and splash out around £350 on one of these devices? In short, it depends on how willing you are to convert and re-encode video. The clear winner of this test is the Archos AV400, closely followed by the Gmini 400. Although sound quality was consistently good with all these players, the problem lies with the various video formats flying around, such as DivX, Xvid, wmv, mpeg4 and so on, which makes reliable playback a challenge.

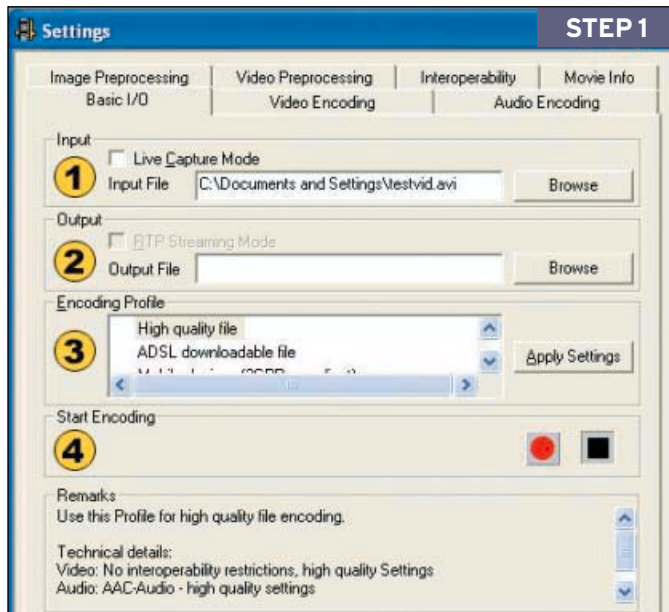
Despite the drawbacks of Microsoft PMC devices, the most notable being the lack of a video recording option, the fact that they synch up with Windows Media Player means you'll have very few compatibility issues. If you're the kind of person who wants something to work first time and every time, and are happy to lose out on functionality, a Microsoft PMC would be a good choice. But if you don't mind getting your hands dirty with a bit of video conversion when you come across an incompatible file, more advanced players such as the AV400 are well worth considering.

	IRIVER	MOBINOTE	MSI	MUSTEK	PQI	SAMSUNG
	PMP-140	DVX-POD7010	MEGAVIEW 566	PVR-H140	MPACK P800	YEPP YH-999
	£419 (£356.59)	£429.99 (£365.95)	£250 (£212.76)	£269.99 (£229.78)	£429.99 (£365.95)	£399.99 (£340.42)
	N/A	0870 770 0848	0870 160 9500	0870 013 2017	0870 770 0848	0870 242 0303
	www.iriver.com	www.datamind.co.uk	www.morgancomputers.co.uk	www.mustek.de	www.datamind.co.uk	www.samsung.co.uk
	3.5in	7in	3.5in	3.6in	3.5in	3.5in
	40GB	20GB	20GB	40GB	40GB	20GB
	N/A	N/A	SD/MMC	SD/MMC	Compact Flash Type I/II	N/A
	✓	✗	✓	✗	✓	✗
	asf, avi, DivX	wmv, Quicktime, DivX	mpeg4, DivX, motion jpeg, wmv	asf, mpeg1, avi	mpeg1/2/4, asf, wmv, avi, Mod, Xvid	wmv*
	N/A	mpeg4 SP	mpeg4 SP	mpeg4 SP	mpeg4 SP	N/A
	mp3, wma	mp3, wma	mp3, wma, wav	mp3, wma, wav	mp3, wma, ac3, wav, ogg	mp3, wma
	mp3	mp3	mp3	wav	mp3	N/A
	bmp, jpg	jpg, bmp, gif	jpg, gif, bmp, tiff	jpg	jpg, gif, bmp, png, raw	jpg
	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
	Mono	N/A	Mono	Mono	Mono	Mono
	✓	✗	✓	✓	✓	✗
	✗	✗	✓	✗	✓	✓ (wired)
	USB2	USB2	USB2	USB2	USB2	USB2
	Li-ion battery	Li-ion battery	Li-ion battery	Li-ion battery	Li-ion battery	Li-ion battery
	5/12	2/3	3.5/8	Not specified	4.5/10	3/12
	139 x 84 x 32	192 x 115 x 28	119 x 76 x 25	110 x 80 x 30	146 x 82 x 25	107 x 97 x 20
	280g	570g	245g	290g	350g	250g
	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★



If you own a 3rd Generation Partnership Project (3GPP) compatible phone, such as the Nokia 6230, you can convert, transfer and watch video on your mobile. 3GPP (files with a .3gp extension) is the format used by most modern handsets to play back and record video. The process of converting video to 3GPP varies depending on which format the original footage is in and the conversion tools you use. Before you start converting video to 3GPP, it's worth pointing out

that the end results will look and sound nothing like they do with a proper portable media player. Compression will be clearly visible and the low bit-rate audio will take some getting used to, but it's great for watching video while commuting. Here we're using a Nokia 6230 and a Crucial 1GB Multimedia Card (£58 from www.crucial.com/uk). The software we've chosen is Mpegable X4 Live (www.mpegable.com), which costs €19.99 (£14), but a free demo version is available.



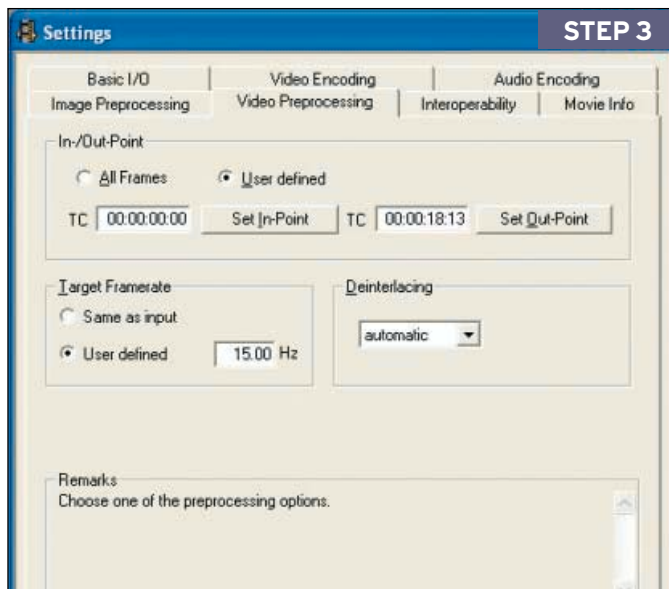
Select a video

Download the free demo of Mpegable X4 Live from www.mpegable.com.

Once you've installed it you'll be presented with the main conversion options. From the Basic I/O tab, use the Browse button to locate the video on your PC you want to convert.

Choose an encoding profile

Mpegable X4 Live is capable of encoding to a variety of formats and includes a number of preset profiles to choose from. A basic 3gpp option is available, but if your phone manufacturer is listed you might find it offers a better conversion. Choose your encoding profile and click on Apply Settings.



Video Preprocessing

The Nokia 6230's media player doesn't feature any track navigation functions, so there's no way of resuming playback. Click on the Video Preprocessing tab and you can elect to convert just a portion of the original file. Try encoding the movie into individual 10 minute segments and use them as chapters when watching the movie on your phone.

Copy to your phone

The red Record button on the Basic I/O tab starts off each encoding process.

When you've converted the entire movie into 10 minute segments (it's a good idea to try a small sample first), then all you need to do is simply copy the files to the memory card and place it in the phone.

PHOTO PRINTER

Canon Pixma IP5000

Excellent quality and fast output



The IP5000 is the first printer from Canon's new Pixma range to arrive in the PCW offices. The sleek black design is a big improvement on the old Bubble Jet series, and should appeal to those with an eye for style.

A paper tray sits underneath the unit and a lid on the top can be flipped up to reveal a second tray. Double-sided printing is also provided as standard, which is a good feature at this price.

However, the most notable specification of the Pixma IP5000 is its 1picolitre ink droplets, allowing prints up to a resolution of 9,600 x 2,400dpi. A total of five separate ink cartridges are used – cyan, magenta, yellow and black, with a second black ink completing the ensemble. This extra black ink attempts to provide extra contrast and depth to photos. Its effect depends on what you're printing, but in general we found it considerably aided performance.

Canon has opted not to include any memory card readers on the printer. It's not something that should concern you too much since it's always best to inspect photos in an image editor before printing. But if you have a Pictbridge-enabled digital camera, the IP5000 allows direct printing using a USB port on the front of the printer. The Pixma IP5000 is marketed as a

photo printer, but it also delivers good performance when printing plain text. The quality is excellent and speeds were very close to the 25 pages per minute quoted by Canon. Our test A4 colour photo took a slightly lethargic five minutes to appear, but standard 6 x 4s can be fired out in just 35 seconds.

If you're looking for a printer that's capable of producing excellent photos, the IP5000 would be a superb choice and comes in at a reasonable price.

Will Stapley

DETAILS

RRP £169 (€143.83 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Canon 08705 143 723

www.canon.co.uk

SPECIFICATIONS

9,600 x 2,400dpi • 5 inks • 1picolitre drop size • 25ppm colour • 17ppm mono • 150 sheet paper tray (x2) • CD printing • Duplex • 6.7Kg • 418 x 286 x 170mm (w x d x h)

PROS Excellent prints; well designed

CONS A4 colour prints take a while

VERDICT

An excellent photo printer that's also capable of delivering fast text output

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

DIGITAL MEDIA PLAYER

Apple Ipod Photo

View pictures as you listen to music



We've seen regular revisions of the Ipod since it was unveiled in 1999 but, until now, most have concentrated on improving ease of use or increasing capacity. The Ipod Photo goes one step further by incorporating a colour display and the option to view digital photos.

Getting images onto the device is straightforward. Pop the pictures you want to transfer into a folder and iTunes 4.7 will synchronise them with the Photo every time you connect it to your PC. It can also turn your Adobe Photoshop Elements 2 and Photoshop Album 2 collections into slideshows.

One major omission is that you can't copy files directly from your digital camera. Another oddity is that only one computer can be used as a source of photos. Connect the Photo to a new PC and it will ask you if you want to replace all the images currently on the unit.

Viewing pictures is just as intuitive as listening to music. You can cycle through a 5 x 5 grid of thumbnail images using the touch-sensitive click wheel then view pictures at a resolution of 220 x 176. The Ipod Photo doesn't let you rotate, zoom or pan images on the go. It also lacks other features found on rivals; for example, the Archos Gmini 400 (reviewed on page 55) can display full-length movies.

Overall we were satisfied with the quality of the colour screen, though it isn't as bright as the displays on some devices. You can connect the unit to a TV or projector to view images while listening to music, but you'll need to get the optional Ipod Photo Dock or AV cable.

Apple's latest Ipod is still an excellent music player, but we can't recommend it to serious digital image hobbyists or anyone looking for a complete all-round multimedia device.

Rory Reid

DETAILS

RRP £248.99 (€211.91 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Apple 0800 039 1010

www.apple.com/uk

SPECIFICATIONS

30GB hard drive (60GB model also available) • 65,536-colour display • Mac or PC • 15 hours music playback • 5 hours slideshow with music • Supports jpeg, bmp, gif, tiff and png

PROS Displays photos; easy to use

CONS Native to one PC; no movie playback

VERDICT

A great way to listen to music but lacks features compared to rivals and has some annoying traits

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



comfort: Open Up and Unlock A World of Possibilities



The W3000A offers total vision satisfaction for both work and play. The widescreen is perfect for entertainment applications and multi-tasking is now possible with the W3000A's option of displaying two windows simultaneously. The new Color Shine display technology further delivers higher brightness and rich color contrast, making the W3000A great for both work and entertainment. Open up the ASUS W3000A and unlock a world of possibilities.

Comfort: Just Stretch Out

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M processor 700 sequence • Mobile Intel® 915GM Express Chipset
- Intel® Wireless/PRO Network Connection 2915 b/g
- Microsoft® Windows® XP Home/Professional



■ 14.0" Widescreen for Cinematic Entertainment Enjoyment



■ Unique Concealed Bamboo Battery Hinge



The New Mobile Processing Platform

ASUS[®]
HEART OF TECHNOLOGY

VIDEO CAPTURE/PVR

Plextor Convertx PVR

Record TV channels and more to Divx



This isn't the first time we've seen a Plextor Convertx PVR. This latest upgrade includes all the features found on its predecessor, but now comes with an integrated analogue TV tuner.

As well as being able to take an input from this tuner, the Convertx accepts signals via S-video and composite connections – so you could connect it to your Freeview or Sky box to record digital channels. A fully-featured remote control is included along with a Scart-to-composite adapter.

Setup is easy – we had the Convertx hooked up to receive signals via composite video and analogue TV signals in minutes. The video can then be converted to a variety of preset formats on the fly, including many versions of Divx.

Intervideo's WinDVR handles the recording process. It's not the most user-friendly software, but the basic settings are relatively easy to master.

The Convertx falls down a little when it comes to scheduling recordings. Although it will happily change channels when a recording is due if you're using an analogue aerial input, things get more complicated when sourcing the video from a Freeview or satellite set-top box, because it has no way of changing the channel from an external source.

Media Center PCs get around this by using an infrared blaster that mimics the set-top box's remote control to change channels. An IR blaster isn't currently available for the Convertx.

If you want a quick method of transferring video and recording analogue TV shows to your PC, the Convertx gets the job done with the minimum of fuss, but the addition of an IR blaster, or digital TV tuner, would greatly increase its appeal.

Will Stapley

DETAILS

RRP £151.56 (£129 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Plextor www.plextor.be

SPECIFICATIONS

Mpeg1/2/4, Divx recording • S-video/composite/analogue TV tuner input • Intervideo WinPVR/WinDVD • Scart-composite adapter • Remote control • 194 × 32.4 × 155mm (w × h × d) • 500g

PROS Easy to use; works well

CONS No digital tuner or IR blaster

VERDICT

The TV tuner adds extra functionality to an already impressive device, but the lack of an IR blaster is a notable drawback. This aside, it's an excellent product

FEATURES

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

DIGITAL CAMERA

Fujifilm Finepix F455 Zoom

A stylish, easy-to-use 5.2megapixel snapper



The latest addition to its Finepix series, Fujifilm's F455 Zoom offers

5.2megapixel resolution and a 3x optical zoom. Roughly the size of a pack of playing cards, it comes either in silver or black and is designed for those who want a stylish, but easy-to-use point-and-shoot camera.

The back features a bright 2in LCD along with zoom control and buttons for common shooting modes, including flash and macro. Other settings include landscape, night and portrait options, while a fully automatic setting takes care of things for those not yet confident enough to play around with manual controls. There's also an optical viewfinder and a switch that allows you to quickly change between image review, video capture and shooting modes.

The buttons are slightly small and the zoom function can be awkward to operate when taking portrait photos. In addition, you can only fit six images on the supplied 16MB XD memory card at the highest quality settings, so you'll need to budget for more storage or switch to one of the three lower resolution modes.

There's space for just under five minutes of video footage, although only at 320 × 240 10fps. This model also features Fujifilm's new battery system,

which the company claims uses less energy and therefore lets you snap for longer.

When you're ready to download your images, Pictbridge compatibility lets you place the camera in the supplied cradle and connect it via a USB cable directly to a printer. A faster USB2 connection would have been nice, though.

Despite some little niggles, the F455 Zoom is a reasonably-priced 5.2megapixel camera capable of impressive results.

Anna Lagerkvist

DETAILS

RRP £259.99 (£214.49 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Fujifilm 020 7586 1477

www.fujifilm.co.uk/di

SPECIFICATIONS

5.2megapixel • 3.4x optical/4.1x digital zoom • 38-130mm focal length (35mm film equivalent) • ISO 80/100/200/400

• On, off, auto, red-eye reduction, slow sync flash modes • Macro 9cm • 2in LCD • 16MB XD memory card • 93 × 56 × 22mm (w × h × d) • USB

PROS Good value; battery life; quiet

CONS Awkward positioning of some of the function buttons

VERDICT

Reasonably-priced and stylish, it's only let down slightly by some fiddly controls

FEATURES

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



comfort: My Life. Now Playing.



www.asus.com

The ASUS W5000A's stylish design for modern sophistication is perfect for today's urban metropolitans who demand more than functionality in digital devices. No matter where you are, the W5000A's built-in 1.3 mega-pixel 180° swivel webcam will bring your vision to wherever you wish to be. Built-in microphone and the exclusive LiveFrame software, especially developed for the W5000A, allow easy capturing, recording and playing of photos and videos. The new Color Shine display technology further delivers higher brightness and rich color contrast, making the W5000A the best personal stage to see and be seen.

Comfort: Swivel 180° for Total Image Capturing

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M processor 700 sequence • Intel®915 GM express chipset
- Intel® Wireless/PRO Network Connection 2915b/g
- Microsoft® Windows® XP Home/Professional

- 12.1" WXGA
- ASUS LifeFrame video capturing software
- Bluetooth™ (optional)

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Built-in 180° swivel webcam



Classic black & white designs



The New Mobile Processing Platform

ASUS® HEART OF TECHNOLOGY

For reseller information, please visit our website: http://uk.asus.com/products/notebook/all_list/wheretobuy.htm

Limited twenty four month International Parts & Labour Warranty. Collect and return service within UK only. Prices and Specifications subject to change without notice.

TEAM LING - LIVE, INFORMATIVE, NON-COST AND GENUINE!

DIGITAL MEDIA CAMCORDER

JVC Everio GZ-MC200

A Microdrive-based camera debuts



JVC's Everio GZ-MC200 is one of the first hard disk-based 'digital media' camcorders. Instead of recording to a video cassette it stores footage on a removable 4GB Hitachi Microdrive.

The bundled disc stores an hour of DVD-quality video, or 900 images at 1,600 x 1,200. We were very impressed with the clarity and detail in our test shots, which were on a par with those produced by a more traditional DV camcorder. The Everio's 2.1 megapixel lens also produced good still photos, though it's no match for a modern digital camera.

JVC has gone to great lengths to make things as attractive as possible. The GZ-MC200 has a very compact design and can fit easily in a pocket. Its buttons can be fiddly though, and if you have large fingers you may have difficulty operating the camcorder. The image stabiliser was also disappointing – if you plan to make use of the 10x optical zoom, you'll need to invest in a tripod or have a very steady hand.

One of the major advantages of using a miniature hard disk instead of a DV tape is that the Everio can save each video sequence as a separate mpeg file. This reduces the need to fast-forward through a tape to find a specific point, as each new shot can be previewed in a

thumbnail gallery. A USB2 interface makes transferring video to your PC just as simple – once connected the Everio acts like an external hard drive.

The Everio GZ-MC200 is an impressive camera that offers great performance in a compact package. Standard DV cameras offer the same image quality for less money, but the hard disk-based storage gives it some clever additional features that many users will appreciate.

Rory Reid

DETAILS

RRP £899 (£765 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

JVC 0870 330 5001 www.jvc.co.uk

SPECIFICATIONS

4GB Microdrive • Microdrive/CF/SD card slots • 10x optical zoom (8x still), 200x digital zoom • Mpeg-2 video recording with AC3 audio • Digital still shooting with up to UXGA • 1.8in colour LCD • Auto Flash • 48KHz/16bit stereo voice recorder (wav) • USB2 • Pictbridge & DPOF support • 80 x 55 x 118mm (w x d x h) • 355g

PROS Video quality; fast previews

CONS Fiddly to operate

VERDICT

A flexible alternative to a DV tape camcorder, but it's not cheap

FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

PROJECTOR

Optoma EP739

Good image quality for home and business



The Optoma EP739 is a DLP (Digital Light Processing) business projector that can also be used in a home entertainment environment. The unit is quite chunky but, at 2.4kg, it isn't too much of a hassle to move from place to place.

Included on the projector are analogue D-sub, S-video, composite RCA and DVI connectors, though only the composite and D-sub cables are supplied. These produce good-quality results, but during our tests the EP739 occasionally lost the analogue signal.

We found using a digital connection far more reliable. Picture quality was very good, with no sign of colour splitting, and excellent representation of different tones. Our review model coped well with everything from ordinary text and image-based presentations to movie playback and there are four preset modes (PC, movie, game and sRGB) designed to coax the best picture from different applications.

The EP739 is very easy to use, with a logical menu structure and an infra-red remote control. Home users will be pleased to hear that it isn't particularly noisy, but its chassis can get rather hot with prolonged use.

The projector has an optional short-throw lens (£150), designed to provide a bigger

picture in a smaller space. This is a useful feature, since it lets you have quite a large picture without having to position the projector far away from the wall or screen.

On the whole the EP739 is a great projector and at £1,052 provides excellent value for money – particularly for the business user. At this price it may also be attractive to home users, but we wouldn't recommend it unless you have a fairly large room, as it is extremely bright.

Rory Reid

DETAILS

RRP £1,052 (£895 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Optoma 01923 691 866

www.optoma.co.uk

SPECIFICATIONS

DLP projector with 1,024 x 768 native resolution • 2,300 Ansi lumens • 2,000:1 contrast ratio • 27db • 2.4kg • 5,000-hour lamp life • Supports 4:3/16:9 aspect ratio

PROS Good image quality; price

CONS No DVI cable supplied

VERDICT

The EP739 isn't the most portable projector, but it offers good image quality at an affordable price

FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



A Perfect Blend of Audio/Video Performance and Style

- Groove to your favorite Beethoven's 9th Symphony played by a full orchestra or bass-heavy hip-hop beats.
- The smooth hidden hinge design eliminates the creaky sound when opening and closing a notebook and delivers a clear view of the screen.
- With no gap dividing the touch pad and palm rest, annoying dust accumulation is a thing of the past.
- A latchless design allows you to open the notebook easily without sacrificing display protection.
- These semi-invisible fast keys are stylish and practical, give your full attention to the screen.

ASUS recommends Microsoft® Windows® XP Professional



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ASUS LIVE!™ LIVE!™ LIVE!™ NOT-COST AND BURNING!

MINI ROUND-UP

Power protection

It's a common misconception that total blackouts are the only causes of power-related damage to your PC and data. Unfortunately, the power supplied to your PC isn't as clean as you might hope and occasionally suffers from slight dips or peaks – known as sags and spikes. Natural phenomena, such as lightning, can also play havoc with your system and other equipment attached to the mains.

There are a number of options available to protect your PC and peripherals from damage. The simplest, and cheapest, is a surge protection system. Usually built into a multi-plug adapter, a surge protection unit consists of a metal oxide varistor (MOV). The MOV

will allow the electricity to flow only when a safe level of voltage is reached – at any other time, it will halt the supply, but what it won't do is clean the sags and the spikes from the mains supply.

The next step up is an uninterruptible power supply (UPS), which can run your system for a short time, while you save your work. The two versions of UPS most relevant to home users are known as passive standby, sometimes referred to as offline, and line interactive. Passive standby only kicks in when the power supply is lost, whereas line interactive is always monitoring the supply and conditioning it to ensure attached equipment has a clean supply of electricity.



◀ APC Back-UPS RS

The Back-UPS RS offers battery backup and protection. It's a line interactive unit and it conditions the power supply to ensure all attached equipment has a clean 500VA supply, regardless of any outside power fluctuations.

As with the other devices, LED indicators keep you informed as to the status of the UPS, but the included software, which takes a little getting used to, gives you a better idea of what's going on. Once you've attached it to your PC, via USB or serial ports, you can also set various power management features and auto-save options.

RRP £93.99 (£79.99 ex VAT)

PRODUCT INFORMATION APC 0800 279 9254 www.apc.com

PRO Line interactive UPS

CONS Software could be more intuitive

★★★★★

▶ Riello Dialog Plug 600

A small, compact UPS, the Dialog Plug from Riello uses line interactive technology to prevent damage caused by spikes and sags. A total of four sockets sit on the unit, three of which are supported by the battery during a power failure. It also features protection for your modem/phone line.

This UPS supplies 550VA and will keep everything ticking away for up to 10 minutes during a blackout.

A USB socket on the side of the UPS allows for remote monitoring. Management software can be downloaded from the Riello site, but we found the application tricky to set up and use.

RRP £81.08 (£69.90 ex VAT)

PRODUCT INFORMATION Riello 0800 269 394 www.riello-ups.co.uk

PROS One of the cheaper line interactive UPS

CONS Software is very fiddly

★★★★★



◀ Belkin 1200VA Universal UPS

The line interactive Universal UPS from Belkin is without doubt the heaviest device featured here – its weight is due, in main, to the 1200VA battery inside. With such a large battery, it's able to keep your PC powered for up to 40 minutes if there's a power cut.

Three of the four plugs offer UPS support, while the other protects only against surges. A USB socket allows the unit to be configured and monitored from your PC using some well-designed software.

It's expensive and probably overkill for most home users, but if you want more time during a blackout, or simply have several power-hungry devices that require a UPS, it's well worth considering.

RRP £169.99 (£144.67 ex VAT)

PRODUCT INFORMATION Belkin 00800 223 55 460 www.belkin.com/uk

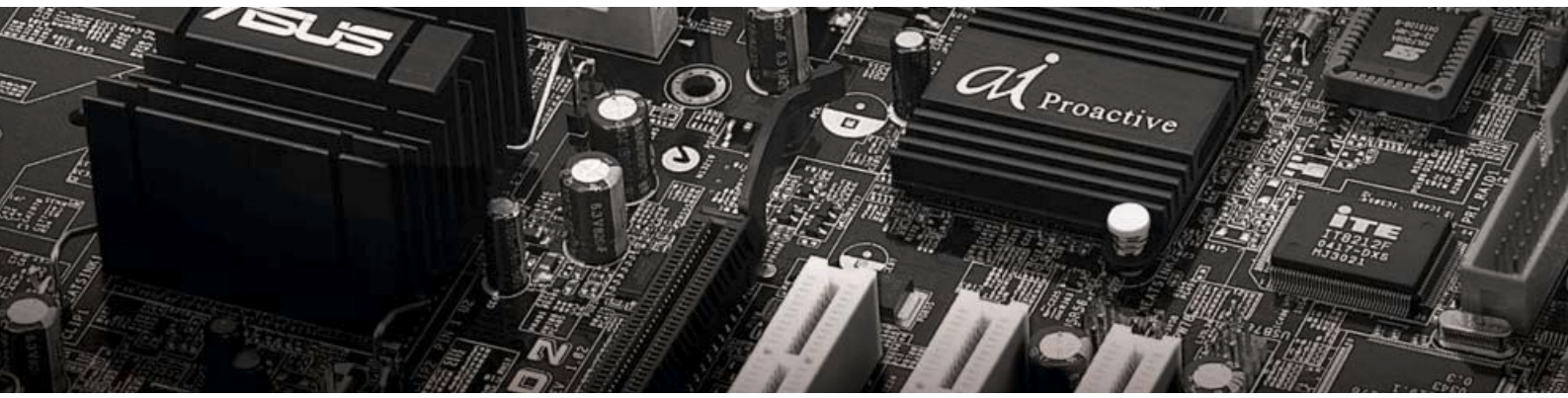
PROS Long battery life

CONS Expensive

★★★★★



Additional UPS reviews from this test: APC Back-UPS ES www.pcw.co.uk/products/hardware/1162296
Belkin Surgemaster Home Series www.pcw.co.uk/products/hardware/1162295



AnandTech and HardOCP Select ASUS Motherboards for 915- and 925-Chipset Platforms

Since Intel's introduction of the 915 and 925 chipsets, over a hundred motherboards supporting the two chipset platforms have hit the market. So which motherboard should you pick when building a system? And who's advice should you listen to?

It's a good idea to get a basic idea of what you are looking for before you walk into a computer hardware store, because there will be sales people and stacks of promotional materials trying to influence your decision with flashy ads and catchy feature names. Be a smart shopper and remember to read up.

AnandTech and Hard OCP, two of the world's three largest hardware testing websites, are good places to start. They recently completed their reviews on motherboards based on the Intel 915 and 925 chipsets. Please refer to the below links for the complete reviews. Hope this will help you make a smart purchase.

Hard OCP: The ASUS P5AD2-E Premium is a must have

"The ASUS P5AD2-E Premium (925-based motherboard) is a feature-rich motherboard with the heart and soul of a true enthusiast platform. It has been rare to see the two types of motherboard so beautifully brought together. I have no trouble whatsoever recommending the ASUS P5AD2-E Premium for your own system. I am currently thinking about using it in my own box as it I am once again itching for the smoothness that an Intel Hyper Threading system will afford me."

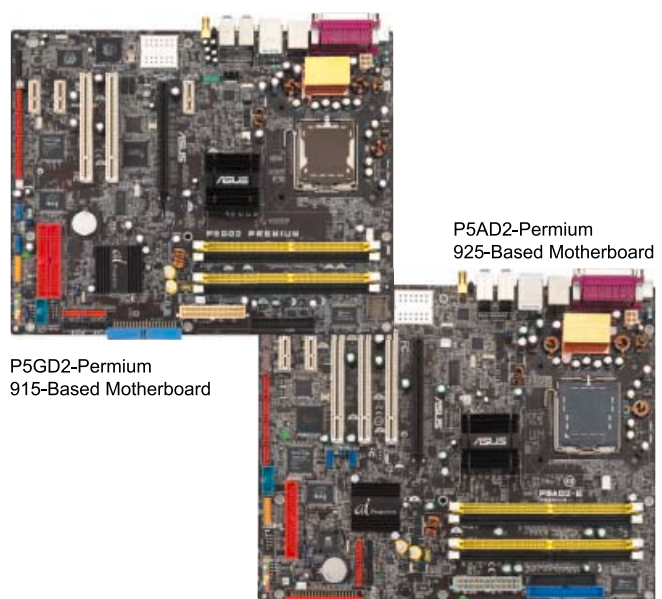
- Hard OCP. <http://www.hardocp.com/article.html?art=NzAx>

ASUS P5GD2 Premium wins AnandTech Gold Editors Choice

"The top performer and clearly undisputed winner in our 915 roundup is the ASUS P5GD2. The Asus

performs very fast, at the top of the heap, in stock performance and it also reaches the highest overclock that we have ever seen on our 560 ES (Prescott 3.6GHz) processor...Based on the best performance that we have ever achieved with a Prescott chip, stellar performance at stock speeds, the top-notch implementation of Intel 915/ICH6R features, the excellent enhancements to those features such as Stack Cool, Dolby Digital Live encoding, WiFi g networking, PCI Express, LAN, high-speed 1394b firewire, and the best overclocking abilities of any 915 motherboard, we are pleased to award the AnandTech Gold Editors Choice to the Asus P5GD2 Premium."

□ AnandTech <http://www.anandtech.com/mb/showdoc.aspx?i=2293&p=33>



P5GD2-Premium
915-Based Motherboard

P5AD2-Premium
925-Based Motherboard



Apple iPod Mini

Now only available in four colours (goodbye gold) and sporting a 6GB hard drive, Apple's latest iPod Mini appears to be better value than ever. Dig a little deeper though, and you'll soon discover why its stylish new packaging is half the original size.

While the Mini itself is undoubtedly a marvel of modern design, it no longer comes with an AC mains adapter. This is now classed as a 'cool optional accessory', so you'll have to cough up another £19 to be able to charge the player away from your computer. The good news is that battery life has been extended to 18 hours.

Despite the penny pinching, the iPod Mini's ease of use and room for 1,500 songs will ensure it remains a big seller. However, its bigger brother is better value.

Chris Cain

RRP £169 (£143.83 ex VAT)

PRODUCT INFORMATION Apple 0800 039 1010 www.apple.com/uk

PROS Fantastic design; improved battery life

CONS No mains charger; bigger iPod is better value

★★★★★



Shuttle XP17 Temp AR

While Shuttle's latest XP17 screen looks identical to the original, released last September, it boasts an 8ms response time (down from 16ms), a revised tempered glass panel and improved contrast ratio of 500:1.

The screen itself now features an anti-reflective coating to stop images losing some focus under certain light conditions. The display is clear and bright with good viewing angles and performed well with a variety of images.

Although the XP17 Temp AR is undeniably attractive, it still has no height or swivel adjustment. This can become annoying during extended use, as the eye level is a touch low.

You'll need to dig a little deeper into your pockets to buy this screen, but Shuttle is carving a solid niche for well-designed, good-quality products.

Rob Jones

RRP £459 (£390.64 ex VAT)

PRODUCT INFORMATION Shuttle <http://global.shuttle.com>

PROS Bright, clear screen; classy look

CONS No height or swivel adjustment; no speakers

★★★★★



HP DVD 640i

HP's DVD 640i is one of the first drives on the market to incorporate the company's new 'Lightscribe' technology. Not only can it rewrite in both DVD plus and minus formats but, if you turn the disc upside down on the tray, it also lets you burn monochrome labels directly onto compatible discs.

Lightscribe media has a special light-sensitive coating that changes colour when it comes into contact with a laser. The result is silk-screen-style labels of a very high standard, but complex designs can take around 20 minutes to burn. Simple text-only labels can be created in around five minutes.

This is a solid performer with the added bonus of Lightscribe, although it's not really suited to anyone who wants to burn labelled discs in bulk.

Rory Reid

RRP £69.99 (£59.56 ex VAT)

PRODUCT INFORMATION HP 0870 0104 320 www.ebuyer.com

PROS Lightscribe; dual-layer writing

CONS Burning labels can take some time

★★★★★



Belkin USB2 3-port hub & 15-in-1 media reader/writer

Belkin's USB hub is ideal for port-starved notebooks, peripheral-hungry desktop users and anyone who has splashed out on a new Mac Mini. The portable unit provides three high-speed USB2 connectors and an integrated four-slot memory card reader that can cope with no fewer than 15 formats, including Compact Flash, Secure Digital, XD and various flavours of Sony Memory Stick.

Setup is plug and play and Belkin's 'Quad TT' technology guarantees a full 12Mbps/sec bandwidth for each USB port. The hub draws its power from the host when used with undemanding devices, such as keyboards or mice, which keeps everything as tidy as possible, but Belkin also provides a mains adapter for use with larger peripherals.

Supplied with copies of Ulead's Photo Explorer and DVD Pictureshow, this is hard to fault, but shop around to get the best price.

Chris Cain

RRP £49.99 (£42.54 ex VAT)

PRODUCT INFORMATION Belkin 00 800 223 55 460 www.belkin.co.uk

PROS Small; good value; 15-in-1 media reader

CONS More ports would be even better

★★★★★

DIGITAL CAMERA

Sony Cyber-shot DSC-T33

A go-anywhere, pocket-sized camera



Big on features, yet small enough to slip into your pocket, Sony's latest Cyber-shot is something of a small wonder. The T33 is available in three colours and packs 5.1megapixels and a 3x optical zoom – all this in an aluminium frame just 20mm deep.

Even more impressive is the 2.5in LCD, which remains easy to use even in direct sunlight. Menu and function controls sit to the right of this and, despite the size of the chassis, the layout is efficient and comfortable; buttons to quickly adjust photo resolution and review the last image are particularly handy. Sony's on-screen menus are logical, but users familiar with other brands may have to hunt for some features.

One area where size has affected the design is the absence of a traditional viewfinder. Another drawback is a lack of manual settings – the T33 is focused on the designer point-and-shoot market. You do get nine shooting modes with various options, a 1cm macro facility, a 640 x 480 30fps movie mode with audio and a USB2 docking station for transferring your snaps to your PC. The latter also lets you charge the battery in the camera – a separate charger would have allowed for more flexibility when using spares.

We managed to get some good shots with T33, although a

few images were slightly blurred at the corners. Having said that, most were detailed with vivid colours and looked great printed at 6 x 4in on a high quality inkjet.

Sony's bundled Picture Package software isn't as well designed as some and it was often easier to transfer images from the camera using Windows Explorer.

If you want a go anywhere point-and-shoot camera, the T33 is a stylish choice.

Chris Cain

DETAILS

RRP £349 (£297.02 ex VAT)
Platinum version (Gold and White available online)

BEST PRICE
www.pcw.co.uk/bestprices

PRODUCT INFORMATION Sony
08705 424 424 www.sony.co.uk

SPECIFICATIONS
5.1megapixels • 2.5in LCD • 3x optical zoom • Macro 1cm • Pictbridge • 125g • 99.4 x 20.7 x 60.9mm (w x d x h) • 32MB Sony Memorystick Duo • Infolithium battery • AV Cable • Cyber-shot station cradle

PROS Sleek design; fast start up

CONS Lacks some features; awkward software

VERDICT
Slim and stylish, the T33 is ideal for point-and-shoot snappers

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

DIGITAL CAMERA

Pentax OptioWP

Take the plunge with this all-weather camera



Take a disposable camera to the beach and you're unlikely to worry about covering it in sand or getting it a little wet. Do the same with your expensive digital camera and you'll soon run into problems.

Pentax has come to the rescue with the OptioWP. Despite its stylish looks and compact design, it's totally waterproof to a depth of 1.5m. It's even fully functional while underwater.

A 5megapixel CCD allows for images up to 2,560 x 1,960 and Pentax has managed to include a 3x optical zoom. To keep it waterproof, the lens doesn't protrude from the case but instead uses a horizontal sliding mechanism to zoom in and out.

With so much time being spent on making the OptioWP waterproof, we weren't expecting great performance. But, after extensive testing, we were pleasantly surprised. Image quality isn't perfect – noise is quite apparent when shooting in low light and purple fringing crops up a little too often – but the OptioWP is more than adequate for holiday snaps.

In terms of manual controls, white balance, exposure compensation and ISO settings are all on offer, while the 20-scene shooting modes help those who simply want to point and shoot.

Sadly, Pentax has only included a paltry amount of

internal memory and no bundled SD card, so you'll have to factor this in to the cost. You can pick up a 256MB card for around £20.

The OptioWP is unlike any other waterproof camera we've seen. It doesn't require a separate casing nor is it bulky and unwieldy – in fact, it's quite the opposite. In short, it's the perfect camera to take on holiday and will withstand the elements, while producing good quality photos.

Will Stapley

DETAILS

RRP £249 (£211.91 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Pentax 01753 792731

www.pentax.co.uk

SPECIFICATIONS

5megapixel • 3x optical zoom • 38-114mm focal length (35mm equivalent) • 2in LCD monitor • SD card (not included) • 10MB internal memory • Li-ion battery, AC charger/adaptor • 116 x 22 x 51mm (w x d x h) • 135g

PROS Totally waterproof; well designed

CONS Noise in low light shots

VERDICT
The OptioWP is durable, stylish and performs well, making it the perfect holiday camera

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

TRIPLE GRAPHICS MOTHERBOARD

ECS 915-A

Dual 3D display makes this a winner

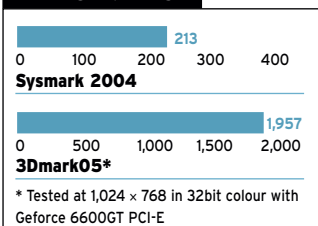


Following the success of Nvidia's SLI technology, most motherboard manufacturers are starting to include some degree of dual graphics capability in their new products. The Intel-based 915-A is the first in the new Dual Graphic Engine series from ECS.

The 915-A offers a choice of three kinds of graphics, plus the option of using either DDR1 or DDR2 memory, making it ideal for those who want to upgrade to the latest technology. The board is well laid out, with plenty of room around all the components and colour-coded and clearly-labelled slots.

Based around a Socket 775, the 915-A is compatible with the latest 800/533MHz FSB Pentium 4 and Celeron processors. There are two 240-pin DDR2 memory slots, supporting DDR2 533/400, and two 184-pin DDR slots for DDR400/333 modules, supporting a maximum of 2GB. ECS has opted for the standard ICH6 Southbridge chip, which doesn't include Raid support.

PERFORMANCE



The star of the show is the graphics subsystem. Using its own patented PCI-Express Lite design, the PCI-E and AGP slots can be used together for a dual 3D display, if desired. Also, ECS has chosen to use the GV version of the i915 chipset, which includes integrated graphics.

Packed with options that allow for a wide range of upgrades, the 915-A offers remarkable flexibility and value for money. ECS is definitely on to a winner with this one.

Simon Crisp

DETAILS

RRP £61.81 (€52.50 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
 Direct From 0870 4000 111
www.directfrom.com
SPECIFICATIONS
 Socket 775 • Northbridge Intel i915GV • Southbridge Intel ICH6 • four memory slots (2x DDR1, 2x DDR2) • 16x PCI-E slot • 8x AGP slot • Intel GMA900 • 2 x 1 PCI-E slots • 2 PCI slots • Ethernet • 7.1 audio • 1 parallel slot • 4 SATA slots • 4 x USB2 ports
PROS Outstanding value for money, three types of graphics
CONS Lack of RAID support
VERDICT
 A versatile motherboard that offers a foothold on the latest technology at a reasonable price
FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

LOW COST GRAPHICS CARD

Sparkle Geforce 6200 TC

A quiet solution for a home theatre PC



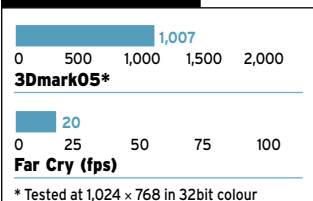
While today's high-end graphics cards can set you back a small fortune, the benefits of their development are beginning to filter down to a more affordable level. The latest offering from Sparkle combines the speed of the new PCI Express bus, with a technology that has been around for years; shared system memory.

Sparkle's card is designed around Nvidia's Geforce 6200 Turbocache, a cut-down version of the 6200, with only four pixel pipelines and three vertex shaders. This is backed by 16MB of dedicated video Ram, but an additional 112MB can be borrowed from system memory, bringing the total to 128MB. The core runs at 350MHz, while the memory clock runs at 350MHz DDR (700MHz effective).

The absence of noisy cooling fans makes this card ideal for those looking for a low-cost, low-noise option for a home theatre PC. It comes with VGA out, DVI-I and S-video out ports.

We tested the card in a system with 1GB of memory. The results

PERFORMANCE



came as no surprise – you won't be playing any hardcore games at high levels of detail, but it does give you a DirectX 9-compatible card at a very low price.

The Sparkle scored 1,077 in 3Dmark 05 and achieved 20fps in Far Cry at a 1,024 x 768 resolution with all details turned on to maximum. Dropping some detail and reducing the resolution to 800 x 600 produced much better results and would still keep casual gamers happy.

Simon Crisp

DETAILS

RRP £52.96 (€45.06 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
 Discount Computer Supplies
www.dcs-online.bi
SPECIFICATIONS
 Core clock 350MHz • Memory clock 700MHz (350MHz DDR) • 16MB DDR3 Ram (onboard), up to 128MB (shared) • Four pixel pipelines • DirectX 9, VGA, DVI, 7-pin S-video out
PROS Low noise, low cost
CONS You'll need at least 512MB of system memory to get the best performance
VERDICT
 It may not suit hardcore gamers, but it's ideal for those building a silent system or home theatre PC
FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

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- COMPUTER SHOPPER, APRIL 2005



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- FSB 2000 MT/s



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- Socket 754 Athlon 64
- FSB 1600 MT/s



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- FSB 1600 MT/s

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pcnextday

www.pcnextday.co.uk

► HIS Radeon X850XT Platinum Edition IceQII

High-end graphics cards are notoriously difficult to buy, and those based around ATI's top-of-the-range X850XT Platinum Edition are no exception. HIS is doing its best to help the situation by delivering more choice into the market.

As you can guess from the name, this is another card that makes use of the huge IceQII cooling system. Here, however, it's used simply as a more efficient, quieter replacement for ATI's standard two-slot cooling solution, rather than for overclocking. Under the cooler, everything else is per reference design; 16 pixel pipelines, six vertex shaders, a 540MHz core clock and 256MB of memory running at 590MHz (1.18GHz effective).

Under test conditions (1,024 x 768 resolution) the card gave 3DMark 03 and 05 scores of 13,101 and 6,022 respectively, and a Far Cry frame rate of 78.6fps with all the detail setting set to maximum. Pushing it further at a resolution of 1,600 x 1,200 with 4 x FSAA (Full Scene Anti-Aliasing) and 4 x AF (Antiscopic Filtering), it still manages a 47.3fps frame rate in Far Cry.

RRP £375.94 (£319.95 ex VAT)

PRODUCT INFORMATION www.overclockers.co.uk

★★★★★



► Aerocool Coolpanel multi-function panel

There was a time when a fan controller was just a fan controller, but these days they offer a multitude of features. Aerocool's Coolpanel is one of the best of these new multi-function panels, offering an 8-in-1 memory card reader, two USB2 ports, a Firewire port, two external Sata ports, three audio ports and a RCA video port.

A small LCD panel shows the temperature of probes in either Celsius or Fahrenheit, together with the speed and status of two fans.

The box also contains all the cabling you are likely to need and a small manual to get you started.

RRP £29.30 (£24.94 ex VAT)

PRODUCT INFORMATION www.overclock.co.uk

★★★★★



◀ Gecube Radeon X800XL

The first thing that strikes you about the Gecube Radeon X800XL is the non-standard heatsink assembly. The graphics card uses Gecube's own Uniwise cooling system, consisting of a copper heatpipe running through a set of copper fins. This provides better heat dissipation, which in turn allows the cooling fan to run slower reducing the noise generated by the card. Gecube quote a noise level of 20db.

Apart from the cooling, the X800XL follows the ATI reference feature set; 16 pixel pipelines, 256MB of DD3 memory, a 400MHz and 500MHz core and memory clock speeds.

In tests at 1,024 x 768, the card achieved 3DMark 03 and 05 scores of 11,779 and 5,164 respectively. It also managed a very respectable 79.6fps in Far Cry.

RRP £279.65 (£238 ex VAT)

PRODUCT INFORMATION www.savastore.com

★★★★★



◀ Coolermaster Real Power RS450-ACLY

Better known for its stylish PC cases and CPU coolers, Coolermaster also offers two small ranges of power supplies; Extreme Power and Real Power. The RS450-ACLY is the flagship model of the Real Power range.

This well-built supply comes with the ubiquitous blue LED lit fan (in this case a 120mm unit) and has intelligent fan speed control, which allows for quiet operation (Coolermaster quote 20dBA).

All the standard cables are supplied and, while it may lack PCI-E power connectors for the latest graphics cards, it does come with an analogue display that fits into any spare 3.5in external drive bay to show the amount of power your system is using.

RRP £65.74 (£55.95 ex VAT)

PRODUCT INFORMATION www.casestech.co.uk

★★★★★



◀ Silentmaxx Watercooled 450W PSU

They say electricity and water don't mix, but Silentmaxx begs to differ. Just to prove the point, it has released a water-cooled power supply. The new unit looks identical to the company's fanless offerings but doesn't have the large heat sink at the rear, which should make it suitable for most tower cases.

Instead, heat generated by the power supply is absorbed by an internal aluminium heatsink and then transferred by a water pipe to the external water-cooled heatsink.

RRP £163.33 (£139 ex VAT)

PRODUCT INFORMATION www.quietpc.com/uk

★★★★★



▶ Enermax CS10068 Venus Micro ATX case

The Venus is one of the latest additions to Enermax's line of PC cases. The stylish micro ATX design can be used as either a desktop or tower (a small stand is supplied) and our review sample sported a particularly impressive black paint job. To help maintain the smooth appearance all of the external drive bays are hidden from view, as are the two USB2 ports, two audio connectors and a Firewire port.

Internally the Venus is well laid out with everything positioned in a way that makes access to the motherboard hassle free. The case comes with a 270W Enermax power supply pre-installed and there is an 8cm fan with room for another should you want one.

The case comes with two 3.5in drive bays and two 5.25in bays, but only one of the latter features a sprung loaded door for an optical drive. Both the smaller drive bays have rubber mounting washers to help reduce vibrations from the hard drives.

RRP £58.15 (£49.49 ex VAT)

PRODUCT INFORMATION www.scan.co.uk

★★★★★



◀ Tagan TG480-U22

How many power supplies do you know that come with a 94 page manual? Admittedly it is in five languages, but even so it's an indication of how much care Tagan takes over its products.

The TG480-U22 is a well-built 480w unit with more than enough connectors to keep most people happy. The main loom and the two 4-pin 12V connectors are encased in plastic nylon netting, while the PCI-E and VGA/HDD Molex connectors are sheathed in clear plastic. Apart from these you get eight 4-pin Molex connectors, four Sata power connectors and two floppy drive connectors. Tagan backs the TG480-U22 with a three-year warranty.

RRP £82.24 (£69.99 ex VAT)

PRODUCT INFORMATION www.scan.co.uk

★★★★★

▶ Small drive adapters

If you're building a compact PC and want to use a 2.5in drive for storage, but are being stopped by incompatible motherboard connectors, help is at hand.

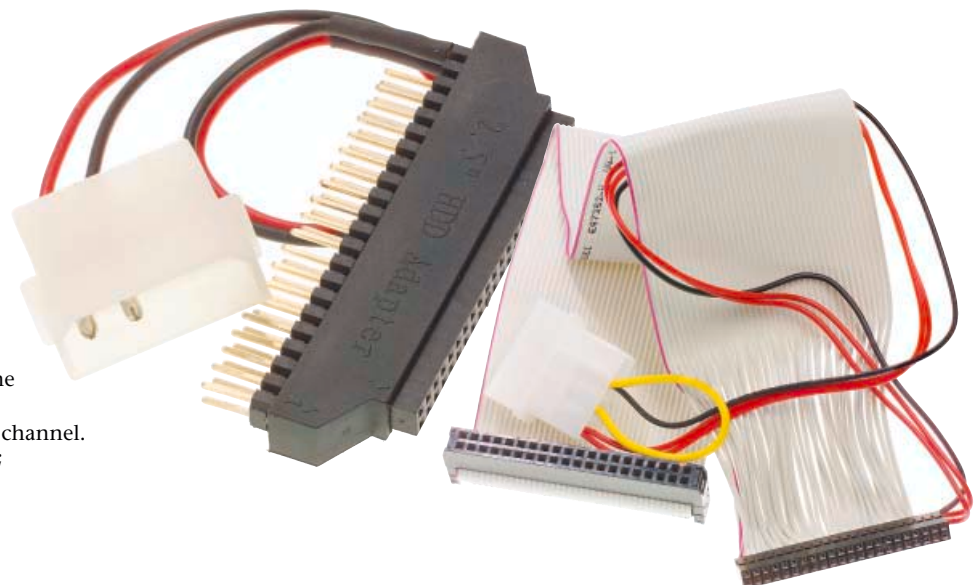
Mini-ITX.com has a couple of cables designed take care of the problem. First up is a 2.5-3.5in IDE flat data cable, which has a 4pin Molex connector at the smaller end to power the drive. Also available is a 2.5-3.5in drive adapter should you want to use two drives on the same channel.

RRP 2.5in to 3.5in IDE data cable £8.81 (£7.50 ex VAT);

2.5in to 3.5in drive adapter £8.81 (£7.50 ex VAT)

PRODUCT INFORMATION www.mini-itx.com

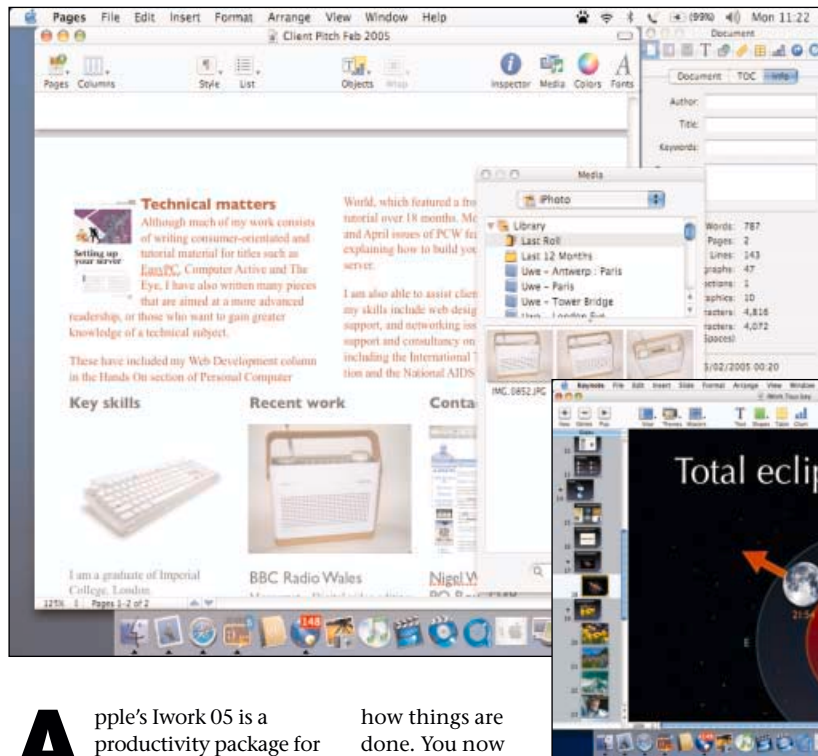
★★★★★



WORD PROCESSING/PRESENTATION

Apple Iwork 05

Create documents and slideshows on a Mac without paying for Office



Left: You can easily browse through images in Iphoto and add them to your document

Below: The Iwork demo is a Keynote tutorial, so you can see how all the fancy effects are created



Apple's Iwork 05 is a productivity package for Mac users who don't need the power, or want to pay the price, of Microsoft Office. It includes an updated version of Keynote, Apple's popular presentation tool, and Pages, a new word processor. The software installs from a DVD in the usual MacOS way, and both products include an extensive selection of templates (Themes) that you can modify for your own use.

The first version of Keynote costs £79, but Iwork gives you more, for £30 less, which is a good start. Keynote was a capable presentation tool and this version adds more themes, and some impressive animation features, which can make transitions or individual slides more eye-catching. The other major addition is a presentation view, which allows you to show the slides on one display while you view your own notes, along with a timer and a preview of the next slide, on another. It's surprisingly easy to create good-looking effects – the Iwork tour is a Keynote presentation and you can view and edit it to see

how things are done. You now also get the option to export a self-running presentation to Flash, as well as pdf or Quicktime.

A new feature in Keynote and Pages is the media browser, which integrates with Apple's iLife products, so you can view photos, movies or music and just drag them from the browser into your document. In Pages, you can drag in just about anything, even a whole pdf, so you can use the front page as a picture, though you'll end up with pretty big files as a result.

For most people, a word processor is where they'll spend a lot of the time, so how Pages performs is important. We found it to be a mixed bag. Like Keynote, there's a wide range of themes, designed to help you create newsletters, reports, brochures and other types of document. They're all designed for you by Apple, and you can just replace pictures and text with your own material to achieve a very slick look; most have several types of page, so you can add a three-column

page following a front page, for example. But here we found our first glitch – although there's a DTP-like 'add page' command, there's not one to delete them. You need to select the items on a page and delete them.

In many ways, Pages is more of a layout application than a word processor. There are tools to rotate images and control the text flow round objects, add charts via a data editor and, of course, all those themes to help you create documents.

If you need hardcore word processing, Pages may not be for you – there's no revision tracking, for example, which you need if you're editing work. In addition, the built-in word count only applies to the whole document (though you can download a free service applet to count the words in a selection).

On the positive side, Pages can read and write Word, rtf and Appleworks documents, and you can create pdfs, so you can carry on using your existing files. It's very easy to create

multicolumn layouts, tables, and even manage footnotes or tables of contents. We do think, though, that you'll need a reasonably fast machine if you're planning on creating graphics-heavy documents.

Iwork 05 isn't a complete office suite – but with a capable presentation tool and a pretty good word processor for under £50, it's worth a look. Keynote will suit just about everyone's needs, and the new presenter view should be a great help. As a half-way house between word processor and DTP package, Pages is a strange beast. You can easily produce great-looking documents from the templates, so it'll suit people who need to knock up brochures, flyers and newsletters, as well as most casual word processor users. Even things like footnotes and tables of contents are simple to manage. But if you require features such as revision tracking, mail-merging or macros, you'll need to consider an alternative.

Nigel Whitfield

DETAILS

RRP £49 (€41.70 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Apple 0800 039 1010

www.apple.com/uk

SYSTEM REQUIREMENTS

G3 or better processor, 500MHz or faster, G4/G5 recommended • Mac OS X 10.3.6 or later, Quicktime 6.5, 128MB memory, 512MB recommended • 1GB disk space

PROS Good integration; attractively priced

CONS Niggling interface quirks

VERDICT

Templates make creating good-looking documents easy, but Pages lacks change tracking, which could be important to some users. Good value, as long as you know the limitations

FEATURES ★★★★★

EASE OF USE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

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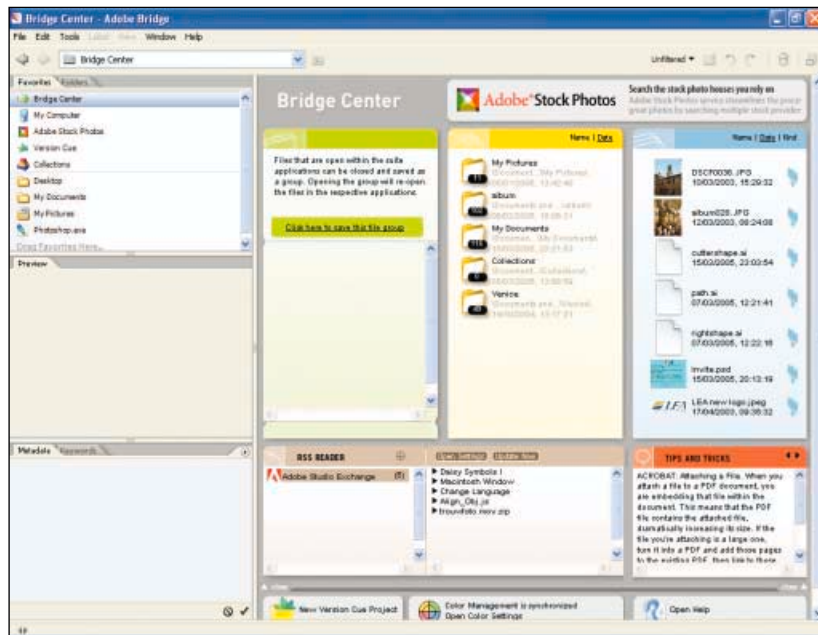
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CREATIVITY

Adobe Creative Suite 2 (Beta)

A multitude of new features and enhancements make this well worth a look



This is effectively five synchronised product upgrades with some additional glue – features designed to further integrate the suite’s applications. Adobe Creative Suite includes Photoshop, Illustrator, Indesign, Go Live and Acrobat.

The glue comes in the form of Adobe Bridge, a new browser/media manager/hub application that replaces Photoshop’s File Browser and is used to manage and exchange files between all applications in the suite. Adobe Bridge organises media in a conventional way with navigation and info panes on the left and a preview area on the right. A Bridge Center view provides quick access to favourites folders and recent files as well as web links to Adobe’s new stock photo library service.

You can customise the workspace and, in our beta version, several presets, such as lightbox, file navigator and metadata focus, were available. Adding and editing XMP-based metadata is possible from Adobe Bridge, avoiding

the need to open the file. You can also conduct metadata-based searches, for example if you want to find all the images that were shot by a particular photographer, or all the Indesign documents containing a specific Pantone colour.

Adobe Bridge also provides application-specific features.

It can be used to batch-process Photoshop files. You can, for example, combine multiple exposures to create a single 32bit high dynamic range image, and batch-process camera raw images. You can also preview and drag and drop Indesign snippets between documents.

Photoshop

Photoshop gains two major new features plus a raft of smaller enhancements.

Vanishing Point adds a new perspective to pasting, cloning and transforming

Adobe Bridge provides access to project files across all Creative Suite 2 applications

Vanishing Point makes cloning, painting and distorting of perspective images a much simpler process. By applying a perspective mesh to image planes you can make all edits conform to this perspective. For example, you can quickly clone or paste a window from one side of a building to another without

having to subsequently use the perspective or distort tool.

Smart Objects is shorthand for live import of Illustrator artwork without rasterisation. Artwork is linked so Illustrator editing is automatically updated in Photoshop. Smart Objects can be resized without loss of resolution, but you

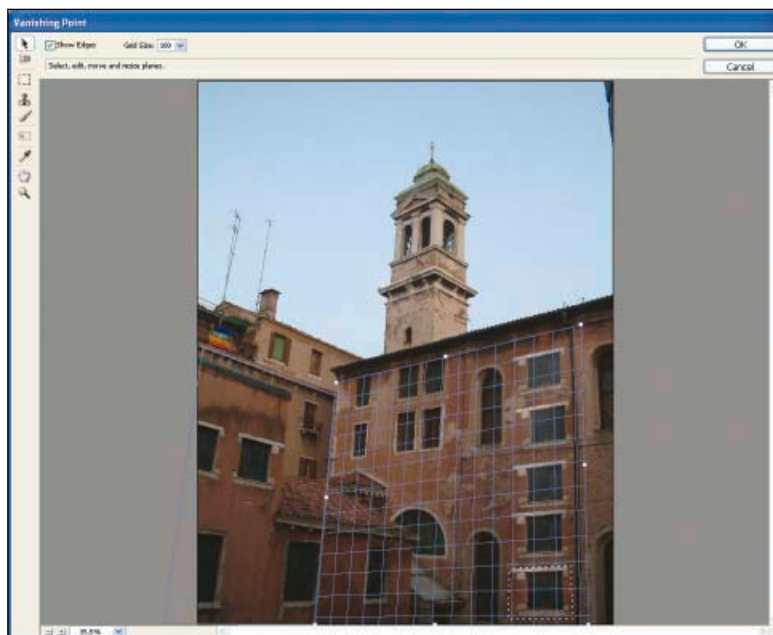
can’t edit curves or change fill and stroke attributes.

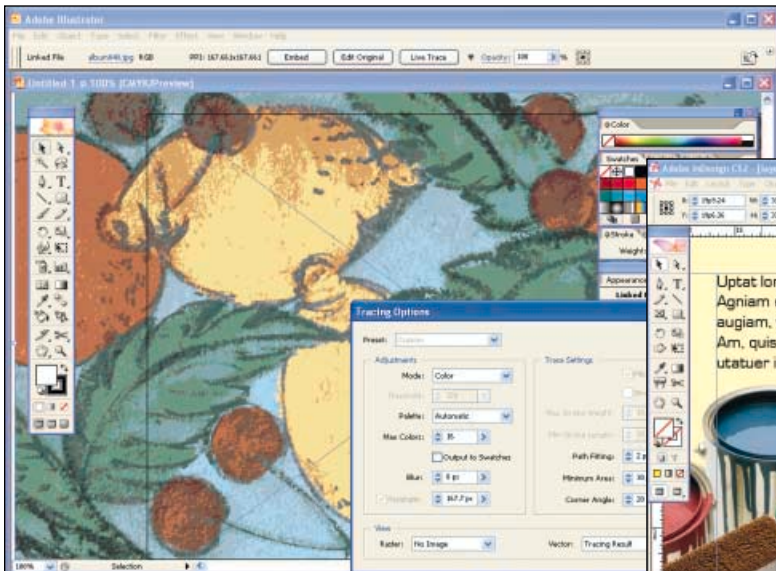
The new Reduce Noise filter will do away with the need for plug-ins to address this problem for all but the most demanding digital photographers. You can treat individual channels and save and load settings. A Smart Sharpen filter specifically targets typical blur situations, such as lens blur and motion blur, and provides targeted treatment of shadows and highlight areas.

Of the remaining many enhancements, some provide quick-fix solutions to common problems, while others refine existing features. There’s a Spot Healing brush, One-click red-eye reduction, correction for optical lens distortion, direct warping on the canvas, Shadow/Highlight for CMYK images and more filter options for 16bit images.

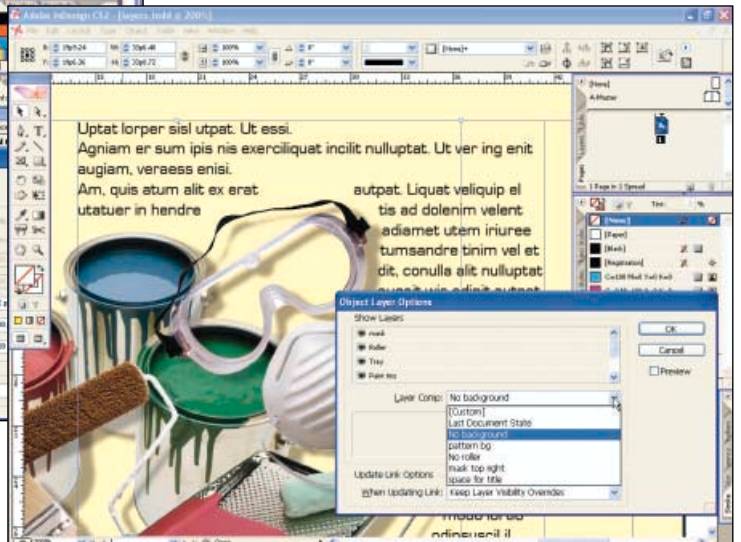
Illustrator

The Illustrator interface has had a clean-up with the introduction of an Indesign-style context-sensitive Control Palette, which will help eliminate screen clutter. The big new feature here is Live Trace, which converts





Left: Illustrator CS2's Live Trace feature converts bitmaps to vector art. The tracing option panel provides sophisticated control and a live preview



Right: Control Photoshop Layers and Layer Comps in placed images using Indesign CS2's Object Layer options

bitmaps to vectors. You can already do this with Illustrator's Trace tool, but Live Trace goes much further, enabling the tracing of entire images in one go and providing sophisticated conversion controls and preset tracing options.

By contrast, the Live Paint feature provides a tool that makes vectors behave more like bitmaps. Live Paint works like a flood fill, or paint bucket tool, filling contiguous areas of colour and ignoring the conventional Illustrator fill and stroke attributes.

Illustrator CS2 extends support for layered Photoshop files by permitting the selection of Layer Comps at import. You can also directly apply Photoshop CS2 effects and filters to vector artwork and placed bitmaps using the Effects Gallery.

Other improvements include support for Wacom tablets, new Flash export features and pdf enhancements, but the primary gain here for existing Illustrator users is that the features provided by Live Trace mean they can uninstall their copy of Adobe Streamline.

Indesign

Indesign also receives a multitude of new features and enhancements. What will interest existing users, as well as potential Quark Xpress migrants, is improved integration with other applications they are most likely already using. Indesign's links with Photoshop are strengthened by support for Layer and Layer Comp visibility.

Essentially what this means is that you can import a Photoshop file with several Layer Comps and switch between them in Indesign to see which works best on the layout.

Snippets allow the storage and exchange of bits of a layout incorporating multiple objects – a picture together with its caption box for example. This isn't all that new, but uses Adobe's XML-based inx format providing a more flexible and easily interchangeable approach than library objects.

Indesign has long lagged behind Photoshop and Illustrator in its ability to apply multiple style graphics attributes, but that's now

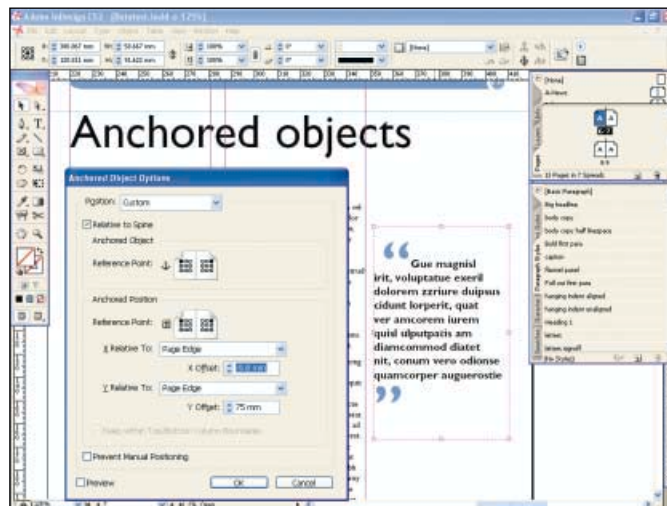
been addressed with the introduction of Object Styles which allow you to apply a variety of graphics formatting, including fill, stroke, transparency, drop shadow and even text paragraph styles in a single stroke.

It wouldn't be an Indesign upgrade without a major new text feature and this comes in the form of Anchored Objects – inline graphics that don't have to be inline, but can be more loosely linked to text column or page margins. This feature allows you to, for example, place pull quotes in the outside margin of a page, where they will stay, even if the pagination changes and left-hand pages

become right-hand ones.

Adobe has also addressed the problem of importing Word documents with styles applied, providing more import options and permitting the stripping of applied styles while retaining formatting of individual words – one of those improvements that sounds trivial, but saves hours of manual labour. CS2 will be available by the time you read this.

Ken McMahon



Indesign's Anchored Objects maintain their relationship to text or page margins even when the layout changes

DETAILS

RRP N/A
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
 Adobe 0800 028 0148
www.adobe.co.uk

SYSTEM REQUIREMENTS
 Pentium III • Windows 2000 (SP4) or XP • 512MB of Ram • 3GB available hard disk space • 1,024 x 768 16bit colour display • CD-Rom drive
PROS Adobe Bridge; support for Photoshop Layer Comps; hundreds of new features and improvements
CONS Steep learning curve for the uninitiated

VERDICT
 There's so much in this upgrade, including Go Live CS2, Acrobat 7 and Version Cue improvements, existing users won't need to consider for too long whether to upgrade

FEATURES ★★★★★
EASE OF USE ★★★★★
VALUE FOR MONEY N/A
OVERALL ★★★★★

Designed exclusively for the enthusiast who demands the ultimate in performance and style.



The Axis 64 Decimator SLI systems include a PCI Express motherboard that supports two physical connectors that are capable of having two NVIDIA-based PCI Express graphics cards plugged into them. Joined by the NVIDIA SLI connector, the two graphics cards power one monitor, delivering earth-shattering PC performance.

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 - Microsoft® keyboard and optical wheel mouse (black)
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 - 200GB 7200rpm hard drive with 8MB buffer
 - 256MB ATI Radeon X700 PCI Express graphics
 - 17" (16" visible) Viewsonic E72f+5B PerfectFlat (CRT) monitor
 - CD-RW drive (52x24x52) with BURN-Proof technology
 - Multi Format Dual Layer DVD Writer (16x) / CD-RW (48x) drive
 - 7.1 channel surround sound (on-board)
 - Creative I-Trigue 2.1 or Creative Inspire 6.1 6700 speakers
 - Microsoft® cordless keyboard and cordless optical tilt mouse
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£989^{inc VAT} (£841.70 ex VAT)



Axis 64 Dominator

"An absolute bargain"
Trusted Reviews, Recommended

- AMD Athlon 64 processor 3500+ with HyperTransport technology
- Microsoft® Windows® XP Home Edition
- NVIDIA nForce4 Ultra motherboard
- 512MB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 200GB Serial ATA hard drive with 8MB buffer
- 256MB ATI Radeon X800 PCI Express graphics
- 19" Viewsonic VX912 DVI TFT monitor (12ms response)
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (48x) drive
- 7.1 channel surround sound (on-board)
- Creative I-Trigue 2.1 or Creative Inspire 6.1 6700 speakers
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10/100/1000 network connection - v92 56k modem - Firewire port - 6xUSB2.0 - Tool free case (Xpider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software. **Floppy drive is optional**

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MS Autoroute 2005 worth £35.69 - MS Money 2005 worth £17.99 - MS Encarta 2005 Encyclopedia Standard Edition worth £16.45 - MS Word 2002 worth £84.99 - MS Works 8 worth £31.48 - MS Photo Premium 10 worth £26.99.

Only available at the time of purchase of a new Evesham system. RRP's taken from www.amazon.co.uk on 16/02/05. Supplied software titles are OEM versions not full retail versions. Product pictures are for illustrative purposes only.

Price does not include delivery which is £34+VAT (£39.95) for PCs, £16.98+VAT (£19.95) for notebooks, FREE for peripherals - UK mainland only. All systems and upgrades are subject to availability. Prices correct at date of publication. Price and specifications subject to change without notice. Finance is subject to status. Evesham's Terms and Conditions apply and are available on request. Actual products may not match photographic representations. Technical Support opening hours are Monday to Saturday 9:00 to 17:20. On-site warranty applies to UK mainland only, monitors are covered directly by the monitor manufacturer. Features, specifications and prices are subject to change without notice. Bundled versions of video cards, sound cards and software are not included.

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Standard Features

10/100/1000 network connection - v92 56k or ADSL modem - Firewire port - 6xUSB2.0 - NEW Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software including 3 months virus updates - 3 year warranty (2 years on-site, 1 year RTB)



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- 17" Viewsonic VX715 TFT monitor (16ms response)
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
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- Creative Inspire P5800 5.1 or Creative I-Trigue 3200 speakers
- Microsoft cordless keyboard and cordless optical tilt mouse

10/100 network connection - v92 56k modem - 6xUSB2.0 - Tool free case (Xplider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software including 3 months virus updates - 3 year warranty (2 years on-site, 1 year RTB) **Floppy drive is optional**

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- 512MB DDR RAM 333MHz
- 60GB, 5400rpm hard drive
- 15.4" WXGA Widescreen display (1280x800)
- 128MB ATI Mobility Radeon 9700 graphics
- DVD/CD-RW/DVD-RW drive
- 6 cell Li-Ion battery (life up to 3hrs approx.)
- Wireless Intel Mini PCI 802.11bg (54Mbps) LAN
- Built-in SD card reader
- Weight - 2.9kg
- Dimensions - 354mmx250mmx32mm

£949 inc VAT (€807.66 ex VAT)

- Intel Pentium M processor 755 - 2GHz clock speed, 2MB L2 cache, 400MHz FSB
- 80GB, 5400rpm hard drive

£1129 inc VAT (€960.85 ex VAT)



Voyager C510

"Highly recommended, Great performance"

- Intel Pentium M processor 730 (1.6GHz, 2MB L2 cache, 533MHz FSB)
- Microsoft® Windows® XP Home Edition
- 512MB DDR2 RAM 533MHz
- 60GB, Serial ATA 5400rpm hard drive
- 15.4" WXGA widescreen display (1280x800)
- 128MB NVIDIA GeForce Go 6600 PCI Express graphics
- DVD/CD-RW/Dual layer DVD-RW drive
- 8 cell Li-Ion battery (life up to 4hrs approx.)
- Wireless Mini PCI 802.11abg (54Mbps) LAN
- Built-in media card reader (MMC, SD, MS-Pro)
- Weight - 2.9kg
- Dimensions - 357mmx276mmx35mm

£999 inc VAT (€850.21 ex VAT)

- Intel Pentium M processor 750 - 1.86GHz clock speed, 2MB L2 cache, 533MHz FSB
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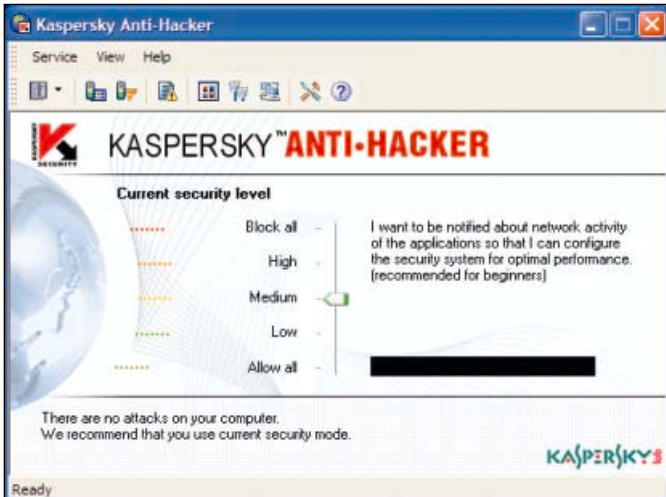


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INTERNET SECURITY

Kaspersky Security Suite 1

Comprehensive security for your PC



The Anti-Hacker feature uses a slide bar to offer control over your security settings. Clicking Stealth mode hides your PC from other web users

Kaspersky is going head-to-head with Norton Internet Security with the release of Personal Security Suite 1. As with Symantec's software, this combines anti-virus and anti-hacker tools, protection from spyware and spam fighting utilities in a single package.

That said, Kaspersky's presentation isn't quite as slick as its rivals. There's no centralised console from which you can control all three elements; the only place they are combined is on the installation disc. Once loaded they operate as three separate tools, with three different manuals.

The anti-virus side includes all of the features we've come to expect. There's the option for a full system scan, a quarantine section for files that can't be cleaned straightaway and regular updates are available via the Internet. Email scanning is also included. The anti-hacker component is essentially a personal firewall, complete with a stealth mode to hide your system from other Internet users. There are predefined rules for common packages and it's easy enough to add your own.

Finally, Kaspersky's email filter works with Outlook and

both SMTP and POP3 email accounts. It will attempt to filter spam as it arrives in your inbox, and adds options to the mail toolbar to classify or declassify messages as junk.

This looks good for under £50, but the annual licence renewal pushes the cost up. At 70 per cent of the cost of the package it comes in at over £30, which is expensive compared to rivals.

Laura Jones

DETAILS

RRP £49.35 (£42 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Kaspersky Lab 0870 011 3461

www.kaspersky.co.uk

SYSTEM REQUIREMENTS

Windows 98/ME/NT/2000/XP • 300MHz processor • 128MB of Ram required • 50MB hard disk space

PROS Comprehensive protection; low purchase price

CONS Expensive subscription cost; no coherence between products

VERDICT

Good protection for your PC, but it doesn't really act as a suite and the subscription service isn't cheap

FEATURES ★★★★★
EASE OF USE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

INTERNET SECURITY SUITE

F-Secure Security 2005

Powerful system protection at a good price

F-Secure has been in the security business for some time, though its corporate focus means the company isn't as well known as Norton or McAfee. F-Secure Internet Security Suite 2005 brings its expertise to home users and this latest update includes spam filtering and spyware detection along with anti-virus and firewall utilities.

Unlike Kaspersky's Suite (see opposite), F-Secure lets you manage all of its functions from a central console. Not only does this feel more professional, it makes things easier to use.

During setup you can choose the features you want to use or exclude, but it's worth noting that, with everything turned on, the software is pretty resource hungry. At full capacity it can slow down all but the fastest of PCs, but any choices made here can be reversed later.

The package automatically updates using online virus definitions and the spyware scanner is integrated with the anti-virus engine, so it will pick up any undercover agents as it examines your system for bugs. Meanwhile, the spam filter is easy to customise and features a choice of aggressive, optimal or relaxed modes. Also new for 2005

are parental controls, which can block access to any websites with unsuitable material.

In tests it proved effective but not intrusive and we were impressed that F-Secure could create such a polished product for the price. However, it does charge a lot for updates – £31.65 to renew your subscription, although this does include an upgrade to the latest version.

Laura Jones

DETAILS

RRP £38.95 (£33.15 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

F-Secure 0845 890 3300

www.f-secure.co.uk

SYSTEM REQUIREMENTS

Windows 98/ME/2000/XP • 600MHz Pentium II processor • 256MB of Ram • 300MB hard disk space

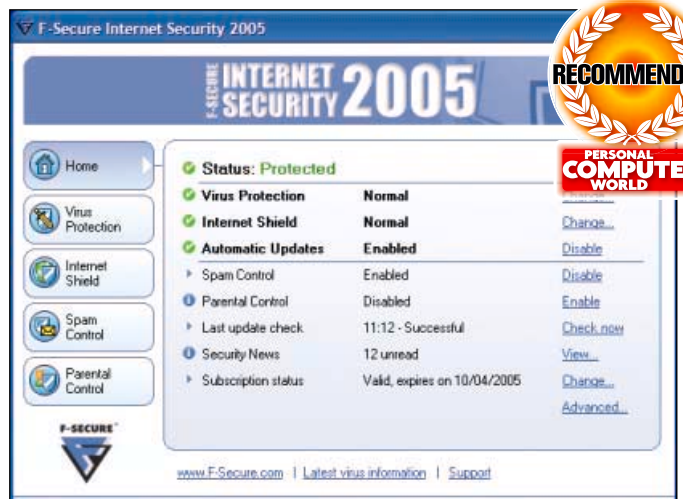
PROS Presentation, price

CONS Costly subscription renewal, system resource hungry

VERDICT

A well-priced, professional product that provides good protection, but you'll need a powerful PC to get the best out of it

FEATURES ★★★★★
EASE OF USE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

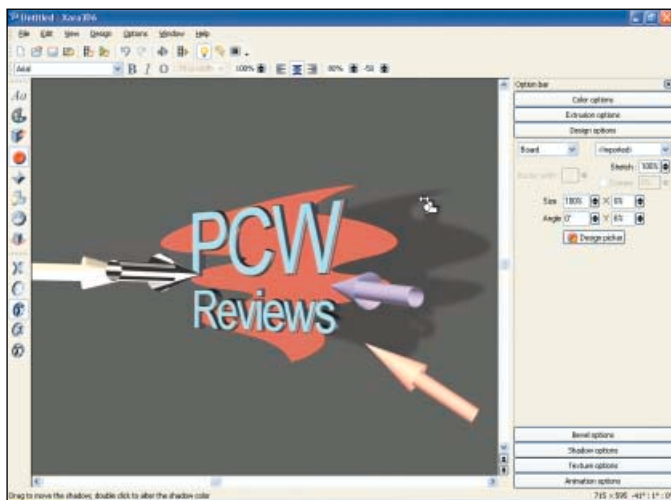


F-Secure allows you to manage all the software features from a central control console

GRAPHIC DESIGN

Xara3D 6

An affordable way to create 3D graphics



You can control how your image is lit by dragging light sources round it and positioning the shadow

Creating good-looking logos is one of the hardest tasks for amateur web designers. Xara3D 6 aims to take a lot of the effort out of it, making it easy to create effects such as bevelled text on a background that looks like stone, or whatever else you might want to do.

When you start the program and create a new document, you're presented with a ready-made logo and surround, which you then click on to change, replacing the Xara text with your own; it can seem a little strange if you're expecting a new document to be blank.

Down the left side of the screen is a range of buttons for text, colour, animation, texture, lighting and 'board options'. These refer to the background, as if your text is mounted on, or cut through, a piece of board. When you move the mouse over the image, things start to get a bit confusing. Depending on where you click, you might be moving the shadow, controlling the thickness of the board or a letter or rotating something. Fortunately the pointer changes shape and a message appears at the bottom of the screen, but it takes a little getting used to.

After some fiddling, though, it's amazing how easily you can create good-looking images, by moving light sources, changing various colours and applying textures to words or board.

If you need a simple way to make effective 3D text-based logos, Xara3D is well worth the astonishingly cheap price.

Nigel Whitfield

DETAILS

RRP \$44.99 (download) – £27.53 (£23.43 ex VAT) at time of writing

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Xara 01442 350 000

www.xara.com

SYSTEM REQUIREMENTS

Windows 98, ME, 2000 or XP • Pentium processor • 60MB of Ram • 60MB disk space • 16bit colour graphics

PROS Flash export; simple to use

CONS Interface confusing at first

VERDICT

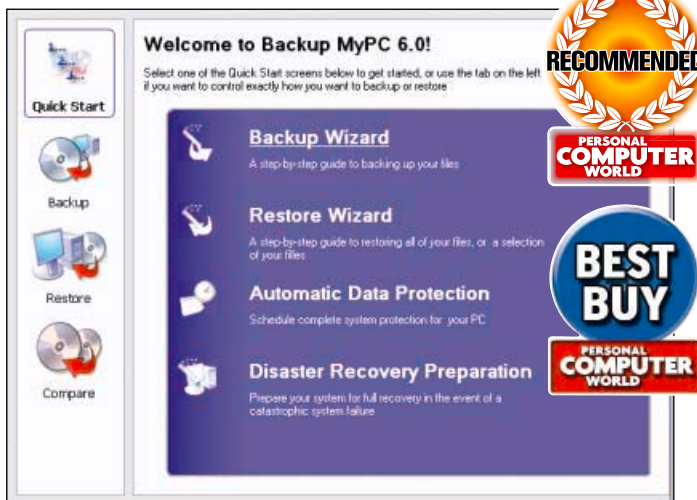
A great-value package that makes creation of logos extremely easy; the Flash export ensures you can have an animated logo on any website

FEATURES ★★★★★
EASE OF USE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

BACKUP

Roxio Backup My PC Deluxe

A simple way to preserve precious PC files



A start-up wizard guides first-timers and non-techies through all the four core components of the software

Backing up your PC is one of those jobs, like checking smoke alarms, or making sure your spare tyre is pumped up and puncture-free, that many of us continually put off. However, should disaster strike, we'd be pleased that we took the time to do it.

Now on version 6, Roxio's Backup My PC Deluxe is designed to make protecting your data much less of a chore. The latest edition includes even more features to make backing up as simple as possible, with wizards to hold your hand in all four main parts of the software.

The Backup Wizard, in particular, makes things easier for first-time users. This guides you through choosing whether to back up your entire hard drive or just selected files and folders and then deciding if you want to continually back up everything or just the files that have changed since last time. Files can be archived to a range of media including CD, DVD and external hard drives. If and when you need to recover any of your data, the Restore Wizard takes you through the entire process.

Also new in version 6 is Automatic Data Protection. The package lets you schedule

automated backups, saving time and trouble, without the need to even know whether you require a full, incremental or differential backup.

Finally, there's the option to create a Disaster Recovery plan for your machine. This lets you build a set of tools to recover your entire system should it fail to boot into the OS.

Laura Jones

DETAILS

RRP £34.99 (£29.78 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Roxio 01908 278 100

www.roxio.co.uk

SYSTEM REQUIREMENTS

Windows XP/2000 • 233MHz Pentium • 64MB of Ram • 40MB hard disk space • Supported backup devices • Tape drive • Network share location • Removable media device

PROS Simple, wizard-led interface; disaster recovery

CONS Firmly aimed at novices – experienced users may want more

VERDICT

Takes the mystery out of backups and is ideal as a simple solution to protect PC files

FEATURES ★★★★★
EASE OF USE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

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Dell™ All-In-One Printer 922

Print, Copy and Scan in a single compact device. The 922 also produces outstanding borderless photo prints.

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- Flat bed scanner up to 19,200 dpi (Interpolated) with 48 bit resolution

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£53
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OFF

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- 3 year next business day service £30 incl. VAT
- USB Cable £13 incl. VAT

Special features

Dell™ All-In-One Printer 942

Print, Copy, Scan with **PC assisted Fax**. The 942 offers enhanced photo features with an LCD screen, card slots and Pictbridge port.

- Black print speed up to 19 A4 ppm
- Colour print speed up to 14 A4 ppm
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- Pictbridge port
- Automatic document feeder with 50 sheet capacity
- Flat bed scanner up to 19,200 dpi (Interpolated) with 48 bit resolution

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Incl. Del. & VAT

Stand-alone
fax

Further enhancements¹

- 2 black and 1 colour cartridge £53 incl. VAT
- Wireless Adaptor £69 incl. VAT



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Technical information

- ✓ Tough and durable zinc alloy, palm-sized satellite speakers.
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- ✓ All cables and brackets included for simple plug-and play set up.
- ✓ Works with any source in the home, including PCs, MP3 players, personal stereos and games consoles.
- ✓ Available in black (code VX48) or white (code VX49).

"Dressed zinc alloy, the AEG02s are the best looking speakers we've seen"

Personal Computer World Best Buys Feb-03

"The sound they produce is better than anything else we've heard from multimedia (PC Specific) speakers"

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"The AEG02 has the most frequency response in the test.

Music is shockingly precise, clear and crisp, without any peaks or troughs"

Personal Computer World Group Test Apr-02



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Zinio Reader 3

Zinio is an alternative to Adobe's Acrobat Reader for presenting electronic documents and is used for many e-magazines. This latest version fixes a number of weaknesses to provide a major upgrade.

The page flip motion of turning pages is now much faster and you can navigate quickly through a title, while the zoom facility allows better magnification of print on the page. Another improvement is a library that shows previously downloaded back issues, which is logical and well laid out, making it easy to search. Searchable annotations are also slicker, as is the word search function, which will find all mentions of a word in both editorial and ads.

Rob Jones

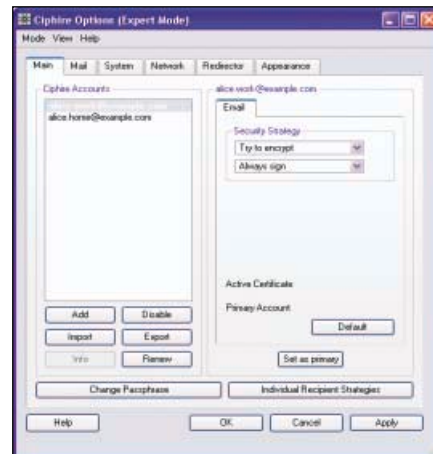
RRP Free

PRODUCT INFORMATION www.zinio.com

PROS Fast; good zoom and search; easy to download magazines

CONS Can only be used with certain titles

★★★★★



Ciphire Mail

Verifying the origin of emails is a difficult task. Public key infrastructure (PKI) encryption systems can do this, but until now they've been difficult to use for non-technical users.

Ciphire Mail is a simple-to-use add-in for almost any email client that verifies the identity of incoming mail from other Ciphire users, and encrypts your outgoing mail so it can be similarly verified at the other end. The program works transparently in the background to verify email signatures and the decryption and encryption is done by the client on your PC. You can secure multiple email addresses, and it also allows you to use an email address on more than one PC.

Kelvyn Taylor

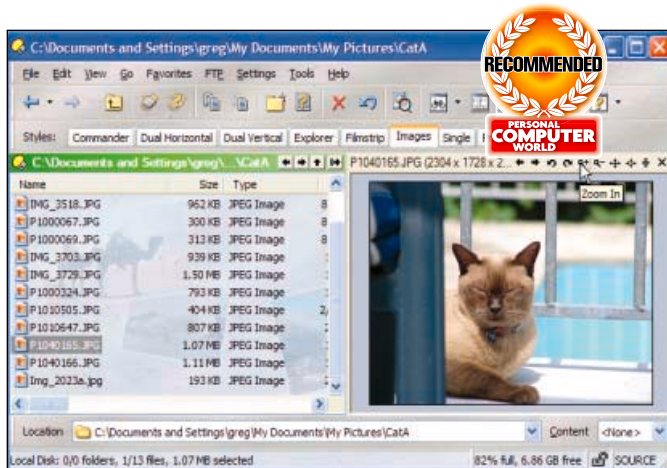
RRP Free (for personal use)

PRODUCT INFORMATION Ciphire www.ciphire.com

PROS Secure; requires little technical knowledge; Linux and Mac OSX support

CONS No Exchange or Lotus Notes support at present

★★★★★



Directory Opus 8

Occasionally you come across a utility that you can't live without. Directory Opus falls into this category. Simply put, this is a Windows Explorer replacement, on steroids.

Fully customisable, it can be as simple or as a complex as you like. You can choose from a single window through to a multi-paned file manager. Opus 8 adds a host of features, including a synchronisation tool that lets you synch between folders or computers across your network. Once you've passed the initial learning curve, you won't want to go back to the standard Windows Explorer.

Chris Wiles

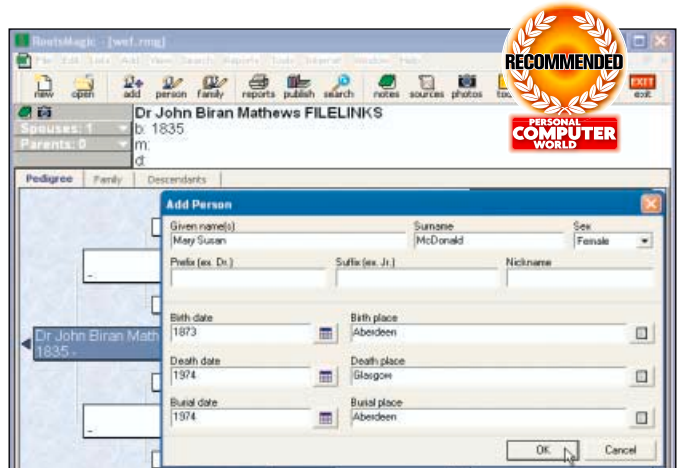
RRP £34.99

PRODUCT INFORMATION GP Software www.dopus.com

PROS So effective, it ought to be included within Windows

CONS May take a while to master

★★★★★



Rootsmagic 2 UK Platinum Edition

Rootsmagic 2 UK Platinum Edition helps budding genealogists to research family history by collating data in a meaningful and shareable format and offers a huge amount of information to aid research. Seven CDs provide vast resources such as English, Welsh and Scottish land ownership data from 1873 and a database of six million names. Other features include a family tree website creator, correspondence logger and a variety of printing options. The interface looks dated, but the wealth of information makes it a highly useful resource.

Will Stapley

RRP £50 (£42.55 ex VAT)

PRODUCT INFORMATION

S&N Genealogy www.genealogysupplies.com 01722 716 121

PROS Loaded with information

CONS Interface could be improved

★★★★★

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HIGH-END PC

Advent T9420

REVIEW March 2005, p56 RRP £1,599

(£1,460 ex VAT) **PRODUCT INFORMATION**

PC World 08705 464 464 www.pcworld.co.uk



This system offers a high specification and, at £1,599, it's great value. If you're after a PC with a multimedia focus that can also handle the latest games and run rings around office applications, it is difficult to beat.

BUDGET PC

Intellect Prodesk A64/28005

REVIEW May 2005, p104 RRP £499

(£424.68 ex VAT) **PRODUCT INFORMATION**

Intellect 08701 225 590 www.intellect.uk.com



If you want a budget PC, you can't go wrong with this Intellect. It might have integrated graphics, but the Athlon 64 2800+, 512MB Ram and stunning Sharp 17in monitor more than make up for it.

MEDIA CENTER PC

Evesham E-box S

REVIEW March 2005, p103 RRP £999

(£850.21 ex VAT) **PRODUCT INFORMATION**

Evesham 0870 160 9500 www.evesham.com



A refined version of the previous Evesham E-box, this features dual digital TV tuners, a quieter cooling system and a stylish design. At under £1,000, it's one of the best Media Center PCs currently available.

BUSINESS NOTEBOOK

Acer Travelmate 8104 WLMI

REVIEW June 2005, p104 RRP £1,499

(£1,276 ex VAT) **PRODUCT INFORMATION**

Acer 0870 900 2237 www.acer.co.uk



With a 2GHz Pentium M and 1GB of Ram, this Travelmate provides excellent performance, portability and usability. It's designed primarily for business, but has no trouble attracting home users.

SONOMA NOTEBOOK

Evesham Voyager C510

REVIEW May 2005, p54 RRP £1,173.83

(£999 ex VAT) **PRODUCT INFORMATION**

Evesham 0870 160 9500 www.evesham.com



This is the fastest Sonoma notebook we've seen and it blazed through our benchmarks. If you want a portable PC that lets you play the latest 3D games, this Evesham is well worth the money.

TABLET PC

AJP T200C

REVIEW August 2004, p48 RRP £1,173.82

(£999 ex VAT) **PRODUCT INFORMATION**

AJP 020 8208 9700 www.ajp.co.uk



The T200C is a convertible notebook combining the features of a traditional laptop with the flexibility of a tablet PC. It includes a digital camera, DVD rewriter and costs just £999 ex VAT.

PROJECTOR

Infocus X2

REVIEW September 2004, p51 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

Infocus 08000 286 470 www.infocus.com



It might be a bit on the heavy side, but considering the price tag of just £799, the Infocus X2 impressed us a great deal. Colours were well represented and text was superbly crisp.

PORTABLE MEDIA PLAYER

Archos AV400

REVIEW June 2005, p54 RRP £314.99

(£268.07 ex VAT) **PRODUCT INFORMATION**

Datamind 0870 770 0848 www.datamind.co.uk



Capable of playing back all manner of video and audio formats, the AV400 from Archos is also able to record video and audio directly as well as function as a fully-fledged personal video recorder.

17IN FLAT-PANEL MONITOR

Samsung Syncmaster 173P

REVIEW November 2004, p117 RRP £389

(£331 ex VAT) **PRODUCT INFORMATION**

Samsung 01932 455 000 www.samsung.co.uk



If you're after a stylish flat-panel monitor that's capable of delivering stunning images, the Samsung Syncmaster 173P comes up with the goods. It's one of the more expensive 17in TFTs, but it's worth the extra money.

PDA

Palmone Zire 72

REVIEW September 2004, p106 **RRP** £199

(£170 ex VAT) **PRODUCT INFORMATION**

Palmone 0118 974 2700 www.palmone.com/uk



We weren't expecting much from the Zire 72, but were pleasantly surprised by its excellent picture quality, the 1.2megapixel camera and great performance.

POCKET PC

HP Ipaq rx3715

REVIEW November 2004, p67 **RRP** £328

(£279.15 ex VAT) **PRODUCT INFORMATION**

HP 0845 270 4222 www.hp.co.uk



The Ipaq rx3715 crams a wealth of features into its diminutive slimline case. Along with all the usual Pocket PC functions, you get a built-in camera, and both Bluetooth and Wifi capabilities.

MULTIFUNCTION DEVICE

Brother DCP-310CN

REVIEW February 2005, p54 **RRP** £119.99

(£102.12 ex VAT) **PRODUCT INFORMATION**

Brother 0870 830 4037 www.brother.co.uk



Although print quality isn't the best we've seen, the DCP-310CN is a good compact all-in-one unit, has the added benefit of being able to hook up to a network and comes at a decent price.

MP3 PLAYER

Apple Ipod

REVIEW January 2005, p129 **RRP** £207.99

(£176.17 ex VAT) **PRODUCT INFORMATION**

Apple 0800 039 1010 www.apple.com



Easy to use and undeniably stylish, the Ipod sets the standard which all other mp3 players follow. Available in a variety of storage options, the only factor that lets it down is battery life.

LASER PRINTER

HP Laserjet 1320nw

REVIEW January 2005, p66 **RRP** £368.95

(£314 ex VAT) **PRODUCT INFORMATION**

HP 0845 270 4222 www.hp.com



There are cheaper personal printers, but with excellent build quality, top performance and wireless support, the 1320nw impressed us a great deal. It comes with a duplex feature as standard.

INKJET PRINTER

Canon Pixma IP5000

REVIEW June 2005, p60 **RRP** £169

(£143.83 ex VAT) **PRODUCT INFORMATION**

Canon 08705 143 723 www.canon.co.uk



The new Pixma IP5000 fires out 1picolitre drops of ink, enabling it to reach new levels of detail. It takes just 35 seconds to print a 6 x 4 photo and, thanks to an extra black ink, they look great too.

MOTHERBOARD

ECS 915-A

REVIEW June 2005, p70 **RRP** £61.81

(£52.50 ex VAT) **PRODUCT INFORMATION**

ECS 0870 4000 111 www.directfrom.com



The Intel-based 915-A offers three types of graphics: integrated, AGP and PCI-Express. The board is well designed and allows for a wide range of upgrades. At just £61, it's a real bargain.

HIGH-END SPEAKERS

Creative Gigaworks S750

REVIEW April 2004, p48 **RRP** £330

(£280.77 ex VAT) **PRODUCT INFORMATION**

Creative www.creative.com



Coming with a wireless remote control, 210w sub-woofer and seven satellites at 70w each, these THX-certified speakers from Creative can completely immerse you in sound.

SOUNDCARD

Creative Audigy 2 Platinum EX

REVIEW May 2003, p76 **RRP** £89.90

(£76.51 ex VAT) **PRODUCT INFORMATION**

Creative <http://europe.creative.com>



This feature-filled card and external unit provides 24/96 recording, 6.1 sound and loads of software, including Cubasis VST 4.0 CE for music makers, and Ulead Videostudio SE DV for movie buffs.

KEYBOARD AND MOUSE

Microsoft Optical Comfort Edition

REVIEW April 2005, p74 **RRP** £79.99 (£68.07 ex VAT)

PRODUCT INFORMATION Microsoft 0870 601 0100

www.microsoft.com/uk



This wireless keyboard from Microsoft has a comfortable ergonomic design and comes with a quick-zoom control and an impressive wireless optical mouse.

POWER SUPPLY

Antec Phantom 350w

REVIEW March 2004, p74 **RRP** £117.44

(£99 ex VAT) **PRODUCT INFORMATION** Overclockers

www.overclockers.co.uk



The Phantom 350w's build quality is second to none. Constructed with aluminium heatsinks and not a single fan in sight, this 350w power supply would be ideal for a home theatre PC.

GRAPHICS CARD

HIS Excalibur X800 XT IceQ II

REVIEW October 2004, p77 **RRP** £365

(£310 ex VAT) **PRODUCT INFORMATION**

Ebuyer 0870 467 0753 www.ebuyer.com



If you're addicted to speed, this device from HIS is the fastest graphics card we've seen in terms of real-world performance. Featuring ATI's Radeon 420 core, it's a real scorcher.

DIGITAL VIDEO CAMERA

Sony Handycam DCR-HC1000E

REVIEW November 2004, p68 RRP £1,300

(£1,106.38 ex VAT) **PRODUCT INFORMATION**

Sony 08705 111999 www.sony.co.uk



If your budget can stretch to £1,300, this is a great camcorder. Not only are its three CCD sensors capable of capturing stunning footage, but it's also very easy to use. Expensive, but well worth the money.

DIGITAL CAMERA

Canon Powershot A85

REVIEW December 2004, p64 RRP £239

(£203.40 ex VAT) **PRODUCT INFORMATION**

Canon 0870 514 3723 www.canon.co.uk



Not only can the Powershot A85 take decent 4megapixel images, but it also comes with a wealth of manual controls, as well as a 3x optical zoom and a 32MB Compact Flash card to get you started.

HIGH-END DIGITAL CAMERA

Canon Powershot Pro1

REVIEW July 2004, p62 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

Canon 08705 143 723 www.canon.co.uk



This well-designed 8megapixel prosumer digital camera is loaded with features, including a 7x optical zoom and remote control. It also takes stunning photos.

DVD-RW

NEC ND-2510A

REVIEW November 2004, p75 RRP £49.93

(£41.91 ex VAT) **PRODUCT INFORMATION**

NEC 020 8752 3665 www.nec.co.uk



The NEC ND-2510A doesn't come with any bundled software or free discs, but this 8.5GB dual-layer DVD is great value for money. At under £50, it's a real steal.

MEDIA CREATION SOFTWARE

Roxio Creator 7

REVIEW June 2004, p73 RRP £69.99

(£59.57 ex VAT) **PRODUCT INFORMATION**

Roxio www.roxio.co.uk



With the ability to edit photos, create home movies and burn CDs, Roxio Creator 7 houses a wealth of features and is very easy to use. What's more, it comes at a very competitive price.

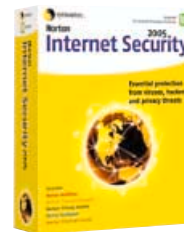
PC SECURITY SOFTWARE

Norton Internet Security 2005

REVIEW February 2005, p80 RRP £54.99

(£46.80 ex VAT) **PRODUCT INFORMATION**

Symantec 01628 592 222 www.symantec.co.uk



Providing protection from viruses, hackers and other privacy threats, as well as parental controls and anti-spam features, this is one of the best products to ensure your PC is both safe and secure.

OFFICE SOFTWARE

Microsoft Office Professional 2003

REVIEW May 2004, p150 RRP £459 (£390.64 ex VAT)

PRODUCT INFORMATION Microsoft 0870 501 0100

www.microsoft.com



This office suite offers a host of features, including a revamped version of Outlook. There are cheaper options available, but Microsoft's Office 2003 is the clear market leader.

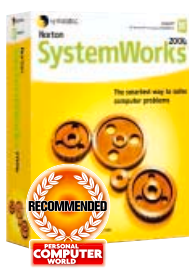
PC MAINTENANCE SOFTWARE

Norton Systemworks 2004

REVIEW March 2004, p68 RRP £64.99

(£55.31 ex VAT) **PRODUCT INFORMATION**

Symantec 01628 592 222 www.symantec.co.uk



If you want to keep your PC healthy and safe from harm, Norton Systemworks 2004 certainly gets the job done, and at the reasonable price of a penny short of £65 to boot.

BACKUP SOFTWARE

Roxio Backup My PC Deluxe 6

REVIEW June 2005, p82 RRP £34.99

(£29.78 ex VAT) **PRODUCT INFORMATION**

Roxio 01908 278100 www.roxio.co.uk



Take the pain out of securing the data stored on your PC. Thanks to a clean and usable interface, and the help of various wizards, Backup My PC Deluxe 6 simplifies the whole process.

IMAGE-EDITING SOFTWARE

Adobe Photoshop Elements 3

REVIEW January 2005, p83 RRP £69.33

(£59 ex VAT) **PRODUCT INFORMATION**

Adobe 020 8606 4001 www.adobe.co.uk



If you can't afford the full version of Photoshop, Elements 3 is a good alternative. Building on the huge success of Elements 2, it's loaded with features and is great value for money.

VIDEO-EDITING SOFTWARE

Adobe Premiere Elements

REVIEW January 2005, p148 RRP £69.33

(£59.00 ex VAT) **PRODUCT INFORMATION**

Adobe 020 8606 4001 www.adobe.co.uk



Based on Adobe Premiere, the industry standard video-editing package, Premiere Elements is perfect for home users who want to edit their videos quickly and effectively without spending a fortune.

MUSIC CREATION SOFTWARE

Steinberg Cubasis VST 5

REVIEW March 2004, p67 PRICE £59.95

(£51.02 ex VAT) **PRODUCT INFORMATION**

Pinnacle Systems www.pinnaclesys.com



This sound-editing tool takes a bit of getting used to, but with a huge range of plug-in effects and a decent collection of virtual instruments, you'd be hard pushed to find a better package at this price.

Platinum
up to 2Mbps*
£29.99

fast just
got faster
with AOL
Broadband

We've doubled the speed of our premium broadband service -
at up to 2Mbps for just £29.99, it's now better value than ever.

Call 0800 376 6606
or visit www.aol.co.uk/platinum



Conditions apply. BT line required. Some alternative broadband products also available in ntl broadband enabled areas. Subject to availability and survey. 12 month minimum contract.
*Platinum packages previously up to 1Mbps now available to new subscribers at up to 2Mbps. See online for details.

TEAM LING - LIVE, INFORMATIVE, NON-COST AND GENUINE!



He is one of a kind
so is his XC Cube



XC Cube EX

With the incredibly powerful XC Cube EX, you're already invincible before you've even started. The combination of up-to-date engineering, SilentTek technology and heat evacuating design makes the FX the ultimate gaming machine. It may be small and space-saving, but its appearance is powerful and sleek. And the expansion possibilities are enormous, allowing you to continue to experience the high-quality graphics and smooth play of the latest and hottest games.



- XC Cube EX18: AMD socket A / nForce2-GT
 - XC Cube EX915: Intel socket T LGA774 / Intel 915G+ICH6
- For more detailed specifications, please visit our website:
www.solution.aopen.com.tw/products/XC/

The EX, which is available with matching TFT screen, speakers, keyboard and mouse (optional), can be fully tailored to your wishes. Game on.





Make Windows bullet proof

WORDS: HEIKO MERGARD, JÖRG GEIGER

Find out how much danger your data is in from viruses, spyware and other threats, check how secure your PC is, and give it the best possible protection

Online dangers are completely exaggerated. I haven't got any anti-virus software, my computer's running fine and why should I bother with a firewall? There's nothing on my PC which could interest a hacker anyway.

An awful lot of people still think like this, if the letters reaching our editorial office are anything to go by.

It's a dangerous line of reasoning, though, as just the spare processing capacity of a PC is enough to interest attackers who construct huge networks of compromised

network hosts (known as botnets) to send out viruses and spam. Other attackers sniff out your personal information to be misused in further attacks and, on your supposedly safe computer, there could be more than 200 viruses and 1,000 items of adware or spyware – this threat is not an exaggeration; it's an everyday reality.

Over the next few pages, *PCW* outlines the latest and most important security trends, and starting on page 94 are some valuable tips and guidelines to help you make your computer secure enough to repel the attacking hordes so you can protect yourself effectively.



Everyone's at risk

Potentially, anyone who uses their computer online could be at risk of attack, but the dangers for both home and business users are still greatly underestimated, according to a report from the National Cyber Security Alliance (NCSA) (www.staysafeonline.infonewssafety_study_v04.pdf).

This study discovered that 84 per cent of the respondents stored sensitive data on their PCs, 72 per cent used that sort of data online and 77 per cent of the online users felt themselves to be safe or very safe, but their line of defence is actually very thin. Two-thirds have either no up-to-date anti-virus software or none at all, and just as many, 67 per cent, don't have a firewall either.

Of those few who do use a firewall, in seven out of 10 cases it is wrongly configured and leaves some ports wide open. The situation for wireless Lan (WLAN) users is pretty alarming: 12 per cent of respondents were using WLANs, but not a single one had enabled WPA encryption. Some 62 per cent had an insecure Wep (Wireless Encryption Protocol) but the rest had left their WLAN unprotected.

Every fifth computer in the survey (19 per cent) was infected by viruses – on some PCs there were as many as 213. The situation was even worse for spyware and adware, as over 80 per cent of the computers were infected by these pests, with an average of 93 and, in the worst case, 1,059 spy tools.

'Computer users should always make sure that they keep their anti-virus software up to date,' advised Christoph Hardy, security consultant at security company Sophos (www.sophos.com). In November 2004 alone 1,379 new viruses emerged and in the first half of the 2004 there were 4,500, five times more than in the same period of 2003. In total at the end of 2004 there were nearly 98,000 viruses in circulation, and by the end of January 2005 this had already risen to 100,000.

Real threats

The main danger is posed by just a few items of malware. Netsky-P and Sober-I account for almost half of all infections, but if you are protected against Bagle, Mydoom and Zafi as well, you're well placed to avoid 90 per cent of virus attacks. Further details about individual viruses can be found on sites like the McAfee Virus Information Library at <http://vil.nai.com>.

Apart from email, peer-to-peer (P2P) file sharing and IRC (Internet Relay Chat) are the main routes for spreading malicious code. And the risk is increasing as nasties like Bagle and Gaobot spread on their own and spawn new variants.

Since 1998 the number of trojans, which sniff out passwords and personal details as well as spreading spam or carrying out DDoS (Distributed Denial of Service) attacks, has doubled.

Trojans working hard

In 2004, about 25,000 trojans appeared. By the end of 2005 this is predicted to have risen to more than 50,000. Particularly active are SD Bots. These are powered by trojans which open a connection to an IRC server, wait for attack commands and then work through firewalls to train botnets (robot networks).

At the beginning of 2004, experts estimated that just 2,000 PCs worldwide were being used as part of one or more botnets, unknown to their owners. This has now mushroomed to over 30,000 a day. A botnet links multiple infected computers together under the control of an



'More than 50 million PC users have received phishing emails, which invite them to visit genuine-looking websites to con them out of passwords. That's why smartcards and biometric data are the way ahead.' Bill Gates, CEO, Microsoft

attacker to send spam or launch DDoS attacks. Botnet operators have now started renting their capacity to organised criminal gangs. The potential damage, especially to the ecommerce sector, runs into millions of pounds. Botnets can also be used to spread malicious code very rapidly.

Blended threats on the rise

Over the past year, there has been a large increase in the distribution of blended threats. This term includes multiple rather than single attackers, worms, trojans and viruses which work together rather than alone, combining multiple distribution and damage mechanisms to exploit security loopholes.

A worm exploits a security loophole to spread a virus, the virus loads a trojan, the trojan opens a backdoor and the infected PC becomes like a remote-controlled zombie. Examples include Plexus, Mydoom and other variants.

The loophole conundrum

Currently the interval between a security loophole emerging, whether in the operating system, the browser or a standard application, and the first exploit (threat) appearing is about six days. However, the time which users have to plug the holes is continually reducing – there is already talk of flash worms and zero-day exploits, which instantly attack new security holes via networks and the Internet on the same day they're discovered. Malicious code like this, for which there is not yet a patch, can spread around the globe in seconds (as in the case of Mydoom-AH).

In 2004 around 3,000 software vulnerabilities were uncovered. For most users, some of them posed little real threat, but of the 1,237 which security specialist Symantec registered in the first half of the year, 70 per cent were easy to exploit and 96 per cent were moderate to serious threats. Unsurprisingly, most of the loopholes were found on unpatched Windows systems and in Internet Explorer. Malware which executed code on the PC and took over control of it was particularly widespread. Users are unlikely to realise this is happening – their online connection speed may drop, but that could easily be put

Table 1 - Top 10 spyware

POSITION	SPYWARE	OCCURRENCE (ROUNDED)
1	Alexa	42%
2	Claria/Gain/Gator	26%
3	WhenU Soft	12%
4	VX2	12%
5	Precisiontime	11%
6	2020search	10%
7	Iwon	7%
8	180solutions	6%
9	Cydoor	5%
10	Ebates	5%

Source: AOL/NCSA

Table 2 - Top 10 most attacked ports

POSITION	PORT	SERVICE USED	SHARE OF ATTACKS
1	TCP/80	HTTP/web	30%
2	TCP/445	Microsoft CIFS Filesharing	17%
3	TCP/135	Microsoft DCE Remote Procedure Call	15%
4	TCP/4662	E-Donkey/P2P filesharing	7%
5	TCP/6346	Gnutella/P2P filesharing	5%
6	TCP/22	Windows Secure Shell/Remote Access	4%
7	TCP/1026	Various dynamic services	3%
8	TCP/113	Ident Service	3%
9	TCP/2745	Beagle	3%
10	TCP/1025	Various dynamic services	3%

Source: Symantec

down to overloaded servers. While this is going on, your data is being stolen, unnoticed.

Fight for survival

During 2004 it was clear that the virus writers were battling among themselves. Apart from their own payloads, some worms and viruses contain functions for removing rival malware. Netsky, for example, cleans up Mydoom and Bagle, drastically increasing the constant flood of new variants.

Investigators and prosecutors are also more on the case. Last year several malware authors who were responsible for Sasser, Netsky, Agobot, Phatbot and Lovesan were arrested.

The root of the problem is that spam has become more than just a source of unwanted advertising. Billions of spam emails are used as carriers for worms, viruses and trojans.

According to email security provider MX Logic (www.mxlogic.com), an incredible 93 per cent of the emails processed by its software are spam, while Frontbridge, which provides 'message management solutions' (www.frontbridge.com) puts the figure at 82 per cent. As both companies are anti-spam specialists, the figures are probably on the high side. However, it's



estimated that by 2007 about 70 per cent of all worldwide emails will be spam.

The prediction is that in 2005 at least 35 billion emails will be sent – in theory, 24.5 billion could be spam, potentially carrying malware.

Annoying and costly spam

The cost of lost productivity worldwide as a result of the tide of spam is estimated at \$20b (£10.4b approx) for 2004. For a firm with 5,000 staff, the cost of dealing with spam is over \$4m a year.

A particular trend in 2004 was the growth of phishing – emails requesting you to visit bogus, but authentic-looking, websites and 'verify your details' by entering bank or other account details, passwords and PINs. An estimated 1.4 million people have fallen victim to this kind of identity theft which has cost banks and credit card issuers around \$1.2b in direct losses. Private individuals have probably lost as much again.

According to the Anti-Phishing Working Group (www.antiphishing.org) 1,142 phishing websites were online in October 2004, with a monthly growth rate of 25 per cent. Phishing attacks are quick – the average phishing site is only online for about six days.

What will the future bring?

The security experts are all in agreement: 2005 will bring us noticeably more of the irritants evident in 2004. Existing trends that will continue to grow include:

- Attacks on web-based applications

Check your security

- **Computer Emergency Readiness Team**

News, reports and statistics. www.cert.org

- **Wildlist**

Information on the most active current virus threats. www.wildlist.org

- **Symantec**

Information and removal tools for current online threats. securityresponse.symantec.com

- **Community for Network Security**

Information, tools and forums. www.whitehats.org

The most secure operating system in the world?

The security holes in Windows XP are numerous and many users question whether it would make sense to move to a more secure operating system.

Linux advocates often argue that the open-source OS is more secure than Windows, although naturally Microsoft counters that the opposite is true. To read more on Linux, see our group test on page 121.

The bottom line, however, is that there is no such thing as a completely secure operating system, as it would have to be 100 per cent bug-free – impossible for such a complex piece of software.

Operating systems that have security as their primary function are not common on desktop PCs. Referred to as 'the world's most secure operating system', Open BSD (www.openbsd.org) is a free version of Unix. Apart from special source code checks, its most important characteristics

are an integrated memory-protection mechanism and integrated cryptography functions.

Changing from Windows to an alternative operating system is not worthwhile if your only concern is security – Linux and MacOS in no way obviate the need for protection and regular updates. Microsoft intends to introduce an improved security concept with Longhorn, the next version of Windows XP.

The current debate is whether or not secure environments can be achieved in Longhorn using virtual machines – this is likely to become a hot topic with Intel's recent announcement of the Vanderpool virtualisation architecture (see News page 39) in its upcoming processors. The advantage of virtualisation is that a client operating system is run on a secure 'virtual PC' isolated from the real system hardware, thus making it much more difficult to infiltrate.





Tips and tricks: how much protection do you really need?

Your first step towards better security for your PC should be to use all of the operating system's built-in features: install the latest patches and updates and configure the operating system and browser securely (see *PCW's* practical advice section below).

You don't necessarily have to bother with expensive adware and spyware scanners or anti-trojan utilities – a good anti-virus program offers better protection than any trojan scanner. If you must have a separate anti-trojan tool then we'd recommend a product such as the freeware version of the Ewido Security Suite (www.ewido.net). The same goes for protection from adware and spyware: in principle a good virus scanner is sufficient, although for added peace of mind you can also use a combination of the free programs Ad-Aware (www.lavasoft.com) and Spybot Search & Destroy (www.safer-networking.org).

As well as anti-virus software, you will need a good firewall. Even if you only have two computers it is a good idea to use a router with a built-in firewall, preferably one that uses stateful packet inspection (SPI) to ensure maximum protection from rogue applications.

In addition you should install a good anti-spam tool to get rid of as many junk emails as possible and avoid the dangers of clickable links.

One of the best tools, if you use Outlook or Outlook Express, is Spambully (www.spambully.com). It is fully configurable and blocks up to 98 per cent of spam emails – well worth the investment of \$22 (£15 approx). Another very effective program that works with any email client is Mailwasher (www.mailwasher.net), which costs \$37 (£19 approx).

- Automated mass mailings, spam, trojan and DDoS attacks
- Viruses with new harmful payloads and their own defence mechanisms
- Targeted attacks on security tools such as anti-virus programs, firewalls and routers
- More intelligent and larger botnets as ISPs crack down on simple botnets
- More backdoor attacks
- Social engineering attacks.

There will also be totally new forms of attack. We had a taste of this in 2004 with Cabir, the first mobile phone



'Apart from Mydoom and Sasser and the increases in adware and spyware, there were positive developments in 2004: more successful police investigations with over 100 hackers arrested.'

Eugene Kaspersky, CEO, Kaspersky

worm, which was really just a proof of concept, like Duts, the first backdoor trojan to hit Pocket PCs. Mobile devices and WLans will come under heavier fire in 2005, because their increasingly widespread use and lack of proper security precautions make them a tempting and worthwhile target.

Today, 12 per cent of online access is via Wifi (projected to be 50 per cent by 2009), so we can expect more use this year of 'war trucking' and 'spam vans'. These techniques involve hackers driving around in cars or vans full of high-tech gear to sniff out open WLans, steal data, infiltrate backdoors and trojans to set up botnets for use as spam relays.

The future of security tools

There will be a trend towards more integration of protection systems in 2005. 'Standalone programs will eventually disappear from the market and give way to comprehensive security suites,' thinks Richard Zwienenberg, senior analyst at anti-virus and firewall vendor Norman (www.norman.com).

The basic concept is that users will no longer have to train themselves to become security administrators but will be able to obtain 'security out of the box'. But the disadvantage of such software bundles is that they will never have the

best tool in every security category. For example, manufacturer A might include the best firewall in its security suite, but manufacturer B might have the best anti-virus solution and manufacturer C the best anti-spam tool.

But Toralf Dirro, security lead at McAfee Germany said: 'Purely reactive anti-virus software has had its day. Combinations of desktop firewalls and intrusion prevention systems (IPS) are now making the running. In 2005 a big theme will be solutions which check networks for security gaps and look for distributed patches.'

The aim of an IPS is to ward off malicious code before it reaches the operating system. However, even a smart IPS can do nothing about the worst security risk – users who click first and think later. After all, most attacks require you to click a button or run an attachment to unleash them.

PCW PRACTICAL ADVICE

Securing XP and Internet Explorer

In order to protect yourself against the wave of attacks, you need to prevent the execution of malicious code on your PC. Effective protection isn't hard, as any hackers who wish to break into a system or take control of a remote system have to overcome three barriers. First, they have to get their files onto the target PC, then they have to persuade either the user or the operating system to run the code and, finally, they don't want to divulge their own identity. Here we'll explain which basic PC security rules you need to stick to and show you how to defend your PC and the data it holds from attacks.

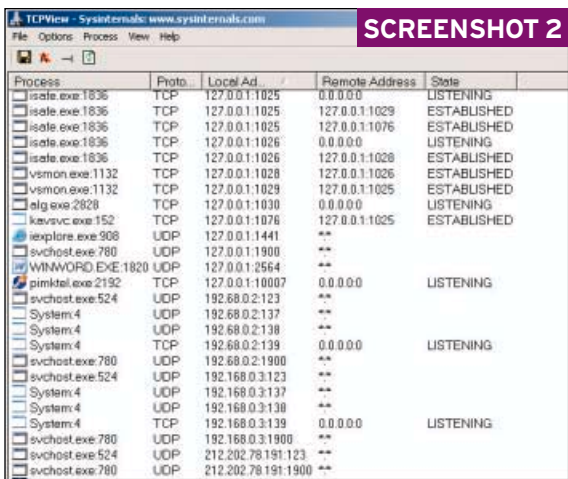
Caution: your most powerful weapon

If you get emails from unknown senders with offers of wealth if you illegally transfer money, they can



SCREENSHOT 1

In spite of a few problems, installing Service Pack 2 is the first step to a secure Windows system



TCPView 2.34 monitors the port usage of running applications and services under Windows XP

Do this by using the XP shell command netstat.exe. Start the program to be tested and carry out the necessary steps to make it access network resources. Open a command prompt (Start> Run> cmd) and then enter:

```
netstat -ano >c:\ports.txt
```

followed by the Return key. Windows will then write a list of all open ports to the file ports.txt which it saves in the root of drive C.

After this, enter:

```
tasklist>tasks.txt
```

and press Return. This will make XP send a list of all currently running tasks to a file called tasks.txt. Open the tasklist.txt file and look in the list of descriptions for the program whose port usage you wish to check and make a note of its Process Identification Number (PID).

In the ports.txt file, look for this PID; the port in use is in the Remote address column and the protocol used is listed in the Proto column. Alternatively you could find out this information by using the freeware program TCPview 2.34 (www.sysinternals.com) (see screenshot 2).

Be selective about sharing ports

As a general rule, you should only allow a few trusted programs to go online without asking for permission

be deleted unread, along with ads for things like cut-price medication.

However, if the messages in your inbox have photos of pop stars or refer to attached documents, curiosity might override common sense: one click and you have enabled the hacker to get over the first two barriers in one go.

The first and most important rule of PC security is to never open an unsolicited attachment. If in doubt, check with the sender to see whether or not they really did send it.

You should also check whether or not the mail provider uses its own virus scanner on outgoing mail. In addition, always keep your own anti-virus program up to date and set it to check archived and compressed files too. Set your firewall to the highest security level – this is the only way to secure your PC against trojans and remote access tools.

Install Windows XP Service Pack 2

Even though Service Pack 2 can't guarantee that Windows XP will be secure, you should still install it. On the one hand, it irons out lots of problems and plugs several security holes, on the other it extends the operating system with new security-focused features such as the Windows Security Center (see screenshot 1).

A system running SP2 has fewer weak points compared to a system running Windows XP with SP1, as is shown by a glance at the Windows Security Bulletin Summary for October 2004 (www.microsoft.com/germany/technet/servicedesk/bulletin/ms04-okt.mspx). If you're using XP and have not yet installed Service Pack 2, you can download it from the Windows Update site or order a CD.

Five essential utilities

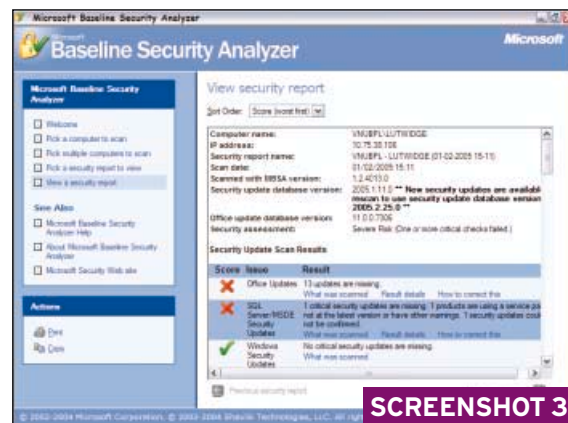
Just as important as Service Pack 2 is a mixture of well-chosen supplementary security software. You should at least have a virus scanner such as Panda Antivirus Titanium, (€40, £28 approx) and desktop firewall, such as Sygate Firewall Pro (€40). These should preferably be combined with a router-based firewall.

It's worth using spam filters, either standalone tools such as Mailwasher Pro 4.1.9 (€30) or a plug-in like Spambully (€22). A secure deletion tool will help rid your PC of the last traces of malicious code. We recommend O&O Safe Erase 2 (€50); alternatively you could use the free Eraser 5.7 (www.heidi.ie/eraser).

The absolute minimum

The minimum level of protection is provided by the Windows firewall included in SP2. If you are going to use it, first of all you need to find out which ports are in use by other software.

You can use Microsoft's Baseline Security Analyzer A 1.2.1 to check for security problems



Top 10 guidelines to protect your PC

Too many users still underestimate the necessity of protecting their own computer, according to a study by AOL and the National Cyber Security Alliance (NCSA) (www.staysafeonline.info/newssafety_study_v04.pdf). Around 67 per cent of the users questioned had no virus scanner or had a PC with out-of-date definitions. A massive 90 per cent of the PCs were infected by spyware and 63 per cent had no firewall.

Ask yourself these question to be on the safe side.

- 1 Do you have an up-to-date virus scanner?
- 2 Do you have a firewall and is it configured correctly/activated?
- 3 Do you make use of all the options for keeping Windows and Internet Explorer safe (automatic updates and security zones)?
- 4 Do you have anti-spam measures and take care not to click on hotlinks in emails/pop-ups?
- 5 Are your passwords personal enough so they can't be guessed; do you have multi-user systems configured with user accounts?
- 6 Have you downloaded software from dubious websites which could introduce spyware to the system?
- 7 Do you take the threat of viruses and hackers seriously?
- 8 Is your wireless Lan unprotected, for example because WPA encryption is not running?
- 9 Are there any unrequired or unchecked operating systems running on your PC, potentially exposing security holes?
- 10 Do you encrypt data or emails and make backups of images?



Decide how and when Windows Update should install patches

first. You can view the Windows firewall exception list by opening the Security Center and clicking on the Firewall settings. If you want to open a port in the Windows firewall, choose Start, Run and enter:

```
firewall.cpl
```

then click OK. On the Exceptions tab, click on the Add Port button to open the Add Port dialog. Next to Name, type the name of the program and add the port number in the field of the same name. Specify the protocol the program uses and click OK.

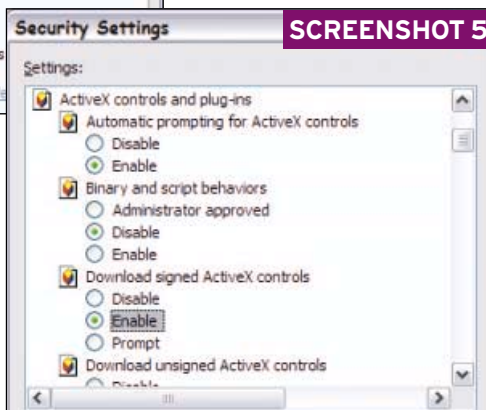
Microsoft offers exhaustive information on working with the Windows XP SP2 Firewall and group policies online (www.microsoft.com/downloads/details.aspx?familyid=4454e0e1-61fa-447a-bdcd-499f73a637d1&displaylang=en).

Finding security holes

Once you have installed SP2, the next item on the agenda is checking the system. Ideally you can do this using the free Microsoft Baseline Security Analyzer 1.2.1 (MBSA) (www.microsoft.com/downloads/details.aspx?FamilyID=b13ebd6b-e258-4625-b0a3-64a4879f7798&displaylang=en-us) (see screenshot 3). Further alternatives for checking system security are listed in the 'Check your security box' on page 93.

The MBSA's security audit pokes around the operating system and typical Microsoft applications, such as Office and Internet Explorer, looking for known weaknesses and suggests possible solutions. If asked, the audit can be carried out across a range of IP addresses, in order to check all the clients connected on a local network. You'll need to have administrator privileges on all the machines to be checked. Depending on the type of check to be carried out, you can decide, after starting the program, whether to analyse a single computer or several.

If you have chosen the first option, select the computer to be tested in the next dialogue and click on Start Check to begin. To start the network check, either select a



ActiveX controls can pose a security risk and should be turned off in Internet Explorer

domain name or enter a range of IP addresses to scan, such as 192.168.0.0 to 192.168.0.10, then click on Start Check.

Security audit on a network

If you are a corporate network administrator and have a local Software Update Services Server (SUS), you need to change the analysis settings. Enable the Use SUS Server option and enter the relevant URL. Instead of performing a network-wide check looking in the complete list of available security updates (saved on the Microsoft website as mssecure.xml), MBSA checks the clients for missing security updates which are stored and allowed on the SUS server. All the updates marked as allowed by the SUS administrator, including superseded patches, are checked and registered by the MBSA. A system check carried out using SUS server support does not currently include updates for the SQL Server, Exchange or Office products.

Fixing problems

The result of the MBSA check is presented in a clear security report in which critical problems are marked with a red X and non-critical ones with a yellow X. To fix a problem, click on 'Procedure for fixing this problem' and follow the instructions.

We advise you to fix all the problems reported by the MBSA as soon as possible and then run it again. This is the only way to ensure the system complies with the latest Microsoft security guidelines.

Made-to-measure Windows updates

You really can't avoid automatic Windows updates any more, as they are the only way to get operating system security patches as soon as they are available. This is more important than ever because of the rise of zero-day exploits.

However, you should only allow Windows to download patches to your computer and not to install them, since you can't be sure that Microsoft will only install things that you need.

To set this option, open the Control Panel in XP and double-click on Automatic Updates. Next, enable the 'Download Updates for me, but let me choose when to install them' option (see screenshot 4). This setting means that Windows will look for new patches on its own and, if it finds any, will download them straight away.

During the download, Windows adds an icon to the system tray, informing you that updates have been found. Click on the icon to view the download status. If you don't want to install one of the downloaded updates immediately, choose Details and uncheck the box next to that update's description. Windows will remind you that you have a download but you haven't installed the update on your computer. You can choose to install this when you like.

The latest news

PCW recommends that all XP users subscribe to the Microsoft Security Bulletin. To do this, go to <http://register.microsoft.com/subscription/subscribe.me.asp?ID=135> and then enter your email address, country and preferred language before sending your request by clicking on Submit. You will then get a confirmation email, with a link leading to a web page where you can complete your registration. As soon as a new update, patch or hotfix is available for a known security problem, all interested users are informed in a newsletter that they can download the software.

Holes in the firewall

Certain Windows Firewall configurations allow others to access shared files and printers, because the firewall includes file and printer shares in the PC's built-in interfaces. There isn't yet a patch, so to be on the safe side you should deactivate the File and Printer Sharing option on the Exceptions tab in the Windows Firewall section of the Security Center.

System administrators who have to be up to speed on security issues, ought to additionally subscribe to the Bugtraq security mailing list at www.securityfocus.com/archive/1, and renowned expert Georgi Guninski concentrates on new Internet Explorer exploits at www.guninski.com.

Windows services: less is more

Installing SP2 by default turns off the Messenger service, which is often abused by spammers, but there is a whole series of further XP services Windows users ought to turn off for security reasons.

The problem is that there is no definitive list of less important services. For example, on PCs using Internet Connection Sharing (ICS) you need to enable 'Shared use of the Internet connection' in the Windows firewall. But if you don't use ICS and use a third-party desktop firewall, then you can turn off the service.

To adjust the start-up behaviour of the 80-odd services to match your own IT infrastructure requires in-depth experience of the system. You can find a good overview of the services in the *PCW* Hands on XP Service feature from the April 2005 issue.

Safe surfing

The more multimedia-rich the Internet becomes, the greater the dangers for surfers. In order to make pages as attractive and user-friendly as possible, designers are using more and more active content relying on ActiveX or Javascript, but these elements can also be misused to install viruses, trojans or diallers.

To prevent this you can either use Firefox as your browser or adjust the Internet Explorer configuration. Choose Tools, Internet options, then check the Internet icon on the security tab and click on Default level.

For more security control, click the 'Custom Level' button. Scroll down the settings list to the ActiveX controls and Plug-ins section and disable all the ActiveX options, except for 'Download signed ActiveX controls' to keep harmful web content off your PC (see screenshot 5).

Now scroll down to the Scripting section. On one hand, scripts based on Java or Visual Basic provide functionality on many sites, but on the other it's just this sort of content that can be dangerous. This is why most security-conscious users turn off all three settings.

If you are still using Internet Explorer 6 SP1 you will have to turn on the High Security option in the Java Settings section of the Microsoft VM.

The disadvantage of these increased security precautions is that a large number of websites rely on the use of ActiveX controls and scripts and, without them, they will not appear properly, or sometimes at all, in your browser.

Configuring security zones

Although Internet Explorer does have a zone system which offers more security than pop-up blockers, cookie and add-in managers, only a few users make use of the Trusted sites and Restricted sites content zones.

You can find a detailed introduction to the zone principle in the documentation for the Resource Kit (www.microsoft.com/resources/documentation/ie/6/all/reskit/en-us/ie6rkit.msp).

You can get help in determining the restricted sites from the tool IE-Spyad (<https://netfiles.uiuc.edu/ehowes/www/resource.htm>). The restricted sites list contains thousands of URLs which are known to be potentially dangerous. Websites listed in this zone can still be



Protection from phishing

A growing danger is posed by phishing attacks. The aim of these is to lure you to a bogus web page and to divulge your sensitive personal details.

There are three basic rules to protect yourself:

- No information: ISPs, online traders and financial institutions will never ask for your PINs, passwords or account details.
- Ignore links: if you really want to follow a link embedded in an email, don't click on it but type the URL into the address line of your browser by hand. This will prevent you being diverted to a bogus site.
- Checking things costs nothing: check the URL is spelled correctly. If in doubt, check with the support department of the company concerned to verify the original message is genuine.

displayed, but are subject to rigid restrictions which render damaging routines useless.

Two versions of this tool are available – IE-Spyad and IE-Spyad 2. IE-Spyad only installs its website blacklist for the current user, while IE-Spyad 2 blocks these sites for all users on the computer. You have to log in as an administrator to install IE-Spyad 2.

You can also customise the security levels for sites you trust by adding them to the Trusted Sites zone, but this isn't recommended unless you're sure the site is safe.

TEST YOUR PC

Once you've secured your PC against attacks, you can test the system to see how well protected it is using security audits. Home users can use one of the many online security tests, while network administrators usually opt for a software solution.

Check browser security online

There are numerous websites you can use to check your browser's security. We recommend Symantec Security Check (security.symantec.com/ssc) or Sygate Security Scan (<http://scan.sygatetech.com>).

Online audits use scripts, such as PHP, Perl, Javascript and ActiveX controls, to work out how secure your browser is, which data it is giving out and which ports are open.

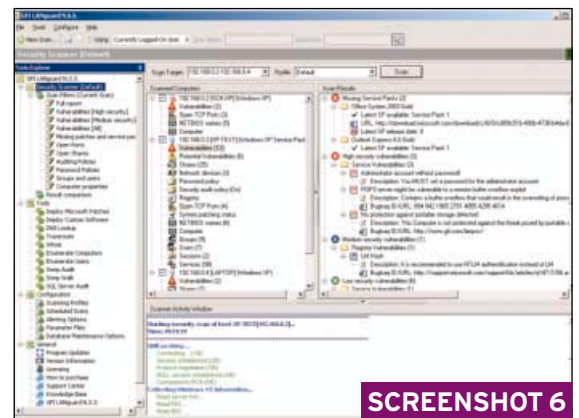
Some even check whether ActiveX controls could be used to rename the Windows directory, restart the system or format a hard disk.

Other useful places for checking your online security include Security-Check (www.security-check.ch), GFI (www.gfi.com/emailsecuritytest) (see screenshot 6) and Shields Up (<https://grc.com/x/ne.dll?bh0bkyd2>).

Virus and system scans

You can also check online whether a system is already infected with viruses, trojans or spyware. Among others,

GFI Lan Guard Network Security Scanner 5 detects all the security risks on a network and shows you how to fix them



SCREENSHOT 6



Check your PC online for security holes at www.securityspace.com, or at www.qualys.de

Trend Micro (www.antispy.com), Kaspersky (www.kaspersky.com/scanforvirus) and Panda Software (www.pandasoftware.com/activescan) offer free online virus scans.

Three free system checks are offered for home and business users by www.securityspace.com (see screenshot 7). Your PC is checked for over 5,600 individual security holes and more than 1,500 service ports are scanned. A desktop audit costs \$10 (£7 approx); the first complete audit for business users is free, but subsequent audits cost \$10. You can set up your system to perform automatic weekly audits.

PHYSICAL SECURITY

Lock and bolt

The best firewall or the most complicated password is useless if data thieves can still get at your PC and even remove complete hard disks. Solutions such as biometrics or locks to create physical barriers will put off opportunist thieves.

Data theft

Physically securing your computer is something which is often overlooked, particularly in businesses. Data thieves can find masses of important information, particularly on a workplace PC, from details of contracts and sales leads, to personnel records and project plans.

Industrial espionage has never been so easy: wear a business suit, get into an office, wait until people are at lunch, boot the PC using a copy of Knoppix on a USB stick and quickly copy a few files, or go in at night dressed as a cleaner with access to all areas and copy as many files as you want.

It's easy to sabotage company data in the same way with viruses, trojans and spyware, which can



Fingertip control: the Hama Flash Pen Secure (€119, £83 approx) will only let you access its contents with the correct fingerprint and password



Casing locks can prevent the theft of PC components

be invisibly introduced to the local network.

You should at least encrypt important data on your hard disk. On Windows XP Pro you can do this with NTFS: right-click on the folder to be encrypted, choose Properties, click Advanced on the General tab and enable the Encrypt contents to secure data option.

If you want to sell your old hard disks – on Ebay for example – you should securely erase them first. One product you can use to do this is the

free Eraser 5.7 (www.heidi.ie/eraser).

Screws for more security

To ensure that your data is really secure, you shouldn't just rely on software-based security measures.

If anyone is going to steal or remove a hard disk without permission, they will need to open the PC. To make this more difficult, you can get lockable case screws, which are available from companies such as PC Guardian (www.pcguardiananti-theft.com) or Kensington (www.kensington.co.uk). And so that the PC or notebook doesn't go walkabout, you can secure them with steel cables and locks.

There are lockable screw mountings for steel cables (€50, £35 approx). Alternatively you can buy special mountings which attach straight to the case with a special adhesive (€15). If there aren't any suitable anchor points in your office, you can mount anchor rings on the wall.

Seal your interfaces

To prevent unauthorised access to the PC you should also seal off the interfaces. Floppy, CD and Zip drive locks (available from Rubin Software www.rubin-software.de and Kensington) are useful for this. There are not yet any USB port locks, so you will have to deactivate them using the Bios or physically remove them altogether.

The future of PC security belongs to biometric systems, which store unchangeable details such as iris patterns and fingerprints and can achieve hardware and software-based security on smartcards. You need both the smartcard and the correct eye to get into the office and then to access the data on the PC.

At present, fingerprint sensors such as the Identix Bio Touch USB200 (www.identix.com, €109) and iris cameras such as the Panasonic BM-DT 120 (www.universalsecurity.ch, €300 approx) present a real hurdle for data thieves.

Secure your hardware

In general, your PC is well secured if it requires more effort to steal the data it holds than the information is worth. Below is a helpful checklist.

- The building: are the PCs in lockable areas? Are the offices always locked if computers are left unattended?
- Paper: are printouts of sensitive data always shredded or just thrown in the waste?
- Network printers: are confidential documents sent to a printer in a public area? Can anyone remove the printouts?
- Theft: could visitors carry out PCs or bypass your security?
- Mobile devices: is the data on notebooks, PDAs, mobiles and smartphones encrypted?
- Access: Can anyone in the building simply turn on a PC and install trojans from a disc, CD or memory stick? Are the cases locked?
- Access: have you minimised the Bios boot options and password-protected the Bios?
- Access: can anyone turn on the PCs or is biometric data needed?
- Access: does your network have clearly defined user permissions?
- Disks: do you ensure disks are fully erased before disposal?

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1&1 Multimedia Archive	✓	✓

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CONTENTS

- 104** Acer Travelmate 8104 WLMi
AJP Z71A
- 105** Asus V6V
HP Compaq NC6120
- 107** Intellect Pronote 5760
MSI Megabook S260
- 110** Sony Vaio VGN-S3XP
Evesham Voyager C510
- 111** What is Sonoma?
- 113** Performance results
- 114** Table of features
- 116** Editor's Choice

Sonoma seduction

WORDS: RORY REID TESTING: VNU LABS PHOTOS: BRUCE MACKIE

The dream of a faster processor and better wireless and audio features is enticing, so to see if the reality fulfils the promise, we put seven next-generation Centrino laptops to the test

A couple of years ago, Intel transformed the notebook industry with its Banias mobile platform. Known to consumers as Centrino, it changed perceptions of what could be achieved with a notebook PC by extending the battery life of large, power-hungry machines and improving performance in thin and light notebooks.

Greater benefits are promised with the second generation of Centrino. Codenamed Sonoma, this provides notebooks with an enhanced processor, a new chipset and memory interface, improved wireless Lan support and high-definition audio.

It all sounds very good on paper, but how do these changes affect the latest products?

To answer this question, we invited seven top notebook manufacturers to submit machines equipped with next-generation Centrino technology.

We wanted to get a wide variety of submissions to really see what new Centrinos are hitting the market, so we did not specify a price point. This enabled us to see how different manufacturers use the various features of the new platform.

We put each one of the notebooks through its paces with rigorous benchmark tests to see whether there is any real difference between this version of the Centrino platform and its predecessor. We also assessed the features, performance and value for money provided by each entry so you can decide which laptop is right for you.



Acer Travelmate 8104 WLMi

The Travelmate 8104 WLMi is intended for use by business users. Aesthetically, however, it should have no difficulty in attracting home users, since it has one of the most uncluttered and stylish layouts we've seen on a notebook PC.

More importantly however, it makes a positive impression below the surface. It uses a 2GHz Pentium M CPU and 1GB of DDR2 400 memory. Unusually for a business notebook, it uses the Intel 915PM chipset, which doesn't have integrated graphics. Instead, Acer has installed an ATI Radeon X700 card, which should appeal mostly to gamers.

Storming its way to the top of our performance benchmarks in both desktop and multimedia applications, the Travelmate achieved a Sysmark 2004 score of 177. That puts it on par with many modern desktop PCs and is only a fraction lower than the top scores achieved by the fastest desktop-replacement notebooks reviewed in our February issue.

Graphics performance was exceptional. We ran Far Cry at a resolution of 1,024 x 768 at 30.97 frames per second (fps), which is a very impressive figure for a notebook. Its high-quality 15.4in widescreen display lends itself well to games, DVD

playback and even standard desktop applications such as word processing, since you can view multiple documents side by side.

Even more impressive was the fact that the Travelmate 8104 WLMi remained remarkably cool to the touch when running demanding applications. Its usability was also helped by its slightly curved ergonomic keyboard, which is very comfortable to use over long periods.

We were slightly disappointed by the comparatively short one-year standard warranty, but if you want a notebook that provides excellent performance, portability and usability, our Editor's Choice award winner is difficult to beat.

DETAILS

RRP £1,499 (£1,276 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Acer 0870 900 2237

www.acer.co.uk

PROS Performance; specification

CONS One-year warranty

VERDICT

Not the smallest notebook, but the Travelmate 8104 WLMi is fast and very well equipped

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



AJP Z71A

This is the largest laptop in the group by some margin and, at 2.9kg, it is also the heaviest. We were therefore surprised that it uses one of the slowest processors in the group, a 1.6GHz Pentium M, and just 512MB of Ram. This spec is more akin to an ultraportable than a desktop replacement, which puts AJP's submission in awkward territory.

A large footprint gives the Z71A room for a decent-sized keyboard, but we found there was little audible indication that we'd pressed the keys. You get a mini Firewire and five USB ports, but AJP hasn't made use of the chassis' PCI Express port.

Fortunately the Z71A puts its considerable girth to good use by incorporating a widescreen 15.1in TFT display. This offers decent all-round viewing angles, making it ideal for watching movies with a group of people. Our review sample was supplied with an eight-speed DVD drive that can write to both plus and minus formats. It is also compatible with dual-layer media, so is ideal for creating large backups if you run out of space on the 80GB hard drive.

The Z71A is good for general office tasks, but you won't be able to make the most of its attractive display in 3D games. It uses the Intel 915GM chipset,

with an integrated Intel graphics adapter. This is an improvement over the graphics cards in previous Centrino notebooks, but you won't be able to increase the level of detail in demanding games such as Far Cry.

The upshot of this lacklustre performance is a considerable three-hour battery life. This is not quite as long as the Megabook S260 lasted, but if you want a notebook that remains powered for a decent amount of time away from the mains, the Z71A is a bulky, but viable option.

At just £851.88, the Z71A is the cheapest laptop here and is less than half the price of Sony's Vaio VGN-S3XP. If you have no desire to play games and are on a tight budget, it is worth a look.

DETAILS

RRP £851.88 (£725 ex VAT)

BEST PRICE & PRODUCT INFORMATION

AJP 020 8208 9755 www.ajp.co.uk

PROS Price; battery life

CONS Performance; size

VERDICT

Surprisingly slow for such a large notebook, but its low price could be too tempting to resist

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



Asus V6V

Asus' first Sonoma notebook will be familiar to anyone who has used the company's original Centrino offerings. Like its predecessors, the V6V is housed in an understated chassis which, despite a brushed-metal finish, won't get you noticed on your travels.

The laptop is very well equipped, with a fast 2GHz CPU and, despite having just 512MB of Ram, it achieved strong benchmark scores. It was particularly impressive in our 3D tests, where its Radeon X600 graphics card helped it run Far Cry at a decent 19.14fps.

Unfortunately the V6V is let down by its comparatively limited storage capacity. Its 60GB hard drive is the smallest in the group, so if you want to store large volumes of data you should consider investing in extra external storage.

Some amends are made by its battery life of three hours 19 minutes – a fairly long time for a notebook of this spec. In contrast, the similarly equipped Asus M6700NE series (based on original Centrino technology) lasted just one hour, 37 minutes.

We were slightly disappointed by the V6V's display. The 15in panel is one of the largest here, but it lacked the brightness and definition seen on the Vaio VGN-S3XP. Its viewing angle is

also relatively narrow across both the horizontal and vertical axes, so it won't be particularly good for DVD movie playback.

Previous Asus notebooks have received favourable comments from us about their usability, and the V6V is no exception. Its keyboard feels solid and is logically laid out. But the mouse touchpad is disappointing, with an outer border that isn't very well defined, so we often found our fingers straying from the touchpad when trying to move the cursor.

The V6V is by no means perfect and, at £1,599, isn't cheap either. However, it is a good example of a next-generation Centrino notebook that should appeal to a variety of users.

DETAILS

RRP £1,599 (£1,360 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Asus 0870 900 2237

www.asus.com

PROS Battery life; performance

CONS Storage space; screen

VERDICT

Hardly exciting to look at, but offers strong performance in a variety of applications

FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

HP Compaq NC6120

Unlike the notebooks in HP's consumer range, the business-oriented NC6120 has a rather sober design. It is reminiscent of an IBM Thinkpad notebook, with its keyboard and mouse touchpad paying particular homage.

Some useful security functions are included, such as support for the Trusted Platform Module, which can encrypt your data and demand user authentication before starting Windows. This limits the chances of unauthorised users accessing your data should the notebook be lost or stolen. The NC6120 also incorporates the HP Mobile Data Protection System, which cushions the hard disk from potentially damaging shocks or vibrations.

A 1.73GHz CPU is more than adequate for its intended uses, but we were surprised that HP supplied 512MB of DDR333 Ram. The quantity isn't such a problem, but by not using DDR2 Ram, HP has failed to take advantage of Sonoma's superior memory handling capabilities.

Fortunately most business users won't notice this drawback. Likewise, its integrated graphics should be fine for its target audience. Whereas the previous generation of integrated graphics chips were capable of running little more than

Solitaire, the NC6120 will happily run DirectX 9 games such as Far Cry – albeit at a low resolution.

The NC6120 has arguably the best connectivity in the group. You get both parallel and serial I/O ports, so the laptop is compatible with any ageing printers, scanners or mice you may have. Bizarrely, there are no PS/2 ports, but there are four USB ports, a mini Firewire one, and this is the only notebook here that has two PC Card slots.

This entry isn't the best example of a next-generation Centrino notebook, but it is ideal for business users who want a reasonably priced machine that has good data protection facilities.

DETAILS

RRP £938 (£799 ex VAT)

BEST PRICE & PRODUCT INFORMATION

HP 0870 010 4320 www.hp.co.uk

PROS Price; data protection

CONS Slow memory modules

VERDICT

A well-priced business notebook, but it doesn't take full advantage of the next-generation Centrino platform

FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



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Intellect Pronote 5760

As much as we tried, it was very difficult to get excited about the rather drab-looking Pronote 5760. It follows the increasingly popular trend of using a silver chassis and has a semi-translucent keyboard, but it falls short of the stylish Vaio and Acer submissions.

However, it is one of the better-equipped notebooks in the group. It uses a 2GHz CPU and has 1GB of DDR2 533 Ram – the fastest memory in our test. In common with most entries, it has an 80GB Fujitsu hard drive with a 5,400rpm spin speed for fast access times.

Notably, it is one of just two notebooks in the group that has an integrated Express Card slot, as well as a standard Type 2 PC Card slot. Currently there aren't any expansion cards available for this, but it helps make the notebook slightly more future-proof than many of its rivals.

The Pronote 5760's strong connectivity features are helped by the inclusion of a full-sized Firewire port, which provides your devices with power as well as data. This means you'll be able to charge the battery of supporting devices such as an iPod, while accessing any stored files. Unfortunately there are only three USB ports, so you may need to buy a USB hub if you have a large number of peripherals. Like

the rest of the entries, the Pronote has considerable wireless capabilities and is compatible with all three current 802.11x wireless network standards.

Given its solid core spec, we expected the Pronote 5760 to have a separate graphics card. Intellect has instead used the integrated Intel graphics chip, which may limit its appeal.

On the positive side though, the Pronote 5760 had one of the longest battery lives in the group. It lasted three hours, 17 minutes – which was an impressive feat for a notebook of this spec.

This is one of the better submissions. It lacks the aesthetic appeal of some of its rivals, but it is fast, functional, and well-priced.

DETAILS

RRP £1,245.50 (€1,060 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Intellect 08701 225 590

www.intellect.uk.com

PROS Battery life; Express Card slot

CONS Not very attractive

VERDICT

If its looks don't concern you, this is a fast, well-equipped and reasonably-priced notebook

FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



MSI Megabook S260

Initially, we were slightly wary of the Megabook S260 due to its chassis. It's a brand we've found in the past had a tendency in some cases to feel as if it is falling to bits. Poorly-fitted keyboards and wobbling hinges are just some of the problems we've seen, but MSI avoided these issues.

The S260 is of a similar size to the diminutive Sony Vaio VGN-S3XP, but the large, jutting battery makes it slightly heavier. This means it is more awkward to carry around, but it can also act as a form of stand, propping up the notebook so its keyboard is at a more usable angle.

As well as being one of the smallest, the S260 is also one of the least powerful notebooks here. It uses a 1.6GHz Pentium M CPU and 512MB of Ram. Not surprisingly it ended up at the bottom of our performance graphs, but its Sysmark 2004 score of 121 means it can still cope with most everyday computing tasks.

Its three hours and 22 minutes of battery life is impressive considering the size and weight of the Megabook S260, and is the best in this test.

We're not entirely convinced the widescreen aspect ratio provides much of a benefit on the S260's small 12.1in display, but it is of a very high standard. The

excellent picture quality should make it an ideal companion to digital photographers or video editors. To this end, MSI has bundled a variety of Cyberlink software to help you produce and copy DVD discs, although some users may have preferred to receive some form of office productivity software.

One inclusion we did appreciate was the notebook carry case, which makes an already highly portable notebook even easier to take on the road.

The Megabook S260 isn't as stylish or as fast as its nearest rival, the Vaio VGN-S3XP, but if your requirements are basic, it is an ideal portable solution that should make a good companion on your travels.

DETAILS

RRP £899 (€765 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Savastore

0870 027 0900 www.msi.com.tw

www.savastore.com

PROS Long battery life; compact

CONS Not as fast as the others

VERDICT

The S260 isn't particularly quick, but is highly portable and has a long battery life

FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



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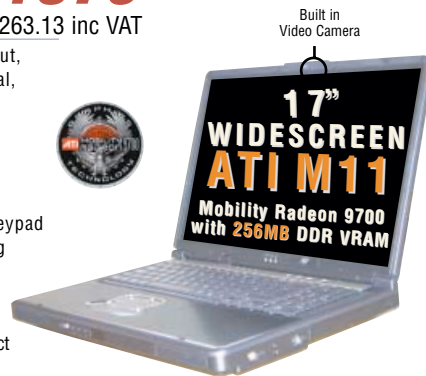
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- 7-in-1 Smart Card Reader
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- Built in Bluetooth Support**
- Full Size Keyboard & Separate Numeric Keypad
- 393(W)x275(D)x37.5mm(H) / Weight: 3.8Kg
- Carry Case, 3 Year RTB Warranty***
- Windows XP Home with CD & Manual
- PANDA Platinum Internet Security -12 months
- Virgin.net - Internet access, NO 12mth contract



Built in Video Camera

ECode: e010

Other Features: Built in 3D Sound with virtual 6 channel output, 1x PC Card Slot, Smart Li-Ion Battery**, 3 Hot Keys (Email, Web Browser, Application), External USB FDD (Optional), Bluetooth module (Optional)**

17" Widescreen	Pentium 4 3.2GHz	1GB RAM	80GB HDD 5400 rpm	DVD-RW/CD-RW	ATI M11	256MB VRAM	Optional 2ND HDD	RAID 0 RAID 1 SUPPORT
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- 3 Year RTB Warranty***
- Windows XP Home with CD & Manual
- PANDA Platinum Internet Security - 12 months
- Virgin.net - Internet access, NO 12mth contract



ECode: e034

15.4" TFT	Centrino 1.73GHz	512MB RAM	80GB HDD 5400 rpm	DVD-RW/CD-RW	PCI Express
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Other Features: Built in 3D sound and speakers, 1x PC Card Slot, Ambient Light sensor to control LCD light, Smart Li-Ion Battery** 5 application keys, (Optional) External USB FDD



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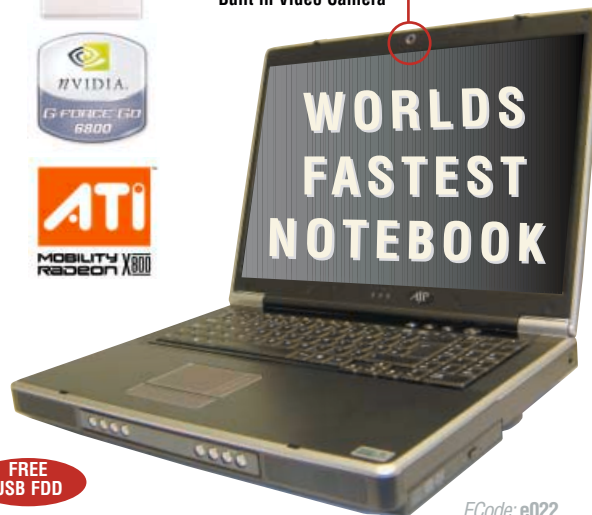
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ECode: e022

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Sony Vaio VGN-S3XP

If this group test were judged on style alone, the VGN-S3XP would be a hands-down winner. And this machine has the performance to match its looks. The first thing that struck us was its excellent TFT display. This uses Sony's X-Black LCD technology, which provides a very bright picture, rich colours and strong contrast.

It's not common for the smallest and lightest notebook in a group test to also be one of the most powerful, but the VGN-S3XP achieves this through its 2GHz CPU and 1GB of DDR2 memory. This gives it strong core performance, but we were more impressed by the 3D capabilities provided by its Geforce Go 6200 graphics card – the only Nvidia solution in the group. In this configuration, it happily ran Far Cry at 25.91fps.

Unfortunately this performance has a negative impact in other areas. The underside of our review sample got remarkably hot to the touch during tests, making it uncomfortable to use on our laps. This is most likely because the cramped conditions inside the notebook aren't particularly conducive to cooling its fast-running CPU.

Despite the heat it generates, the Vaio VGN-S3XP has a surprisingly long battery life. It isn't as impressive as the MSI

Megabook S250, but it lasted two hours in our intensive tests, and will last even longer when running standard desktop applications such as a word processor.

Given its size, we didn't expect many connectivity options. It has just two USB ports and a single Sony Ilink S400 connector, which is not compatible with standard Firewire devices. The inclusion of a VGP-PRS2 docking station is welcome, but this drives the total price up to £1,800.

If you aren't on a restricted budget, the Vaio VGN-S3XP is an excellent all-round notebook. It handles most tasks with ease, looks great, and is thoroughly deserving of a Highly Commended award.

DETAILS

RRP £1,800 (£1,534 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Evesham 0870 160 9500

www.sony.co.uk

PROS Performance; size; weight

CONS Gets hot

VERDICT

Arguably the best ultraportable we've seen, but let down slightly by its inadequate cooling

FEATURES

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



Evesham Voyager C510

The Voyager C510 made its first appearance in our May issue, where it was given a Recommended award. Evesham couldn't supply another unit to be reviewed in time for this group test, but we've included it to show how it fares against the latest competition.

The system coped happily with office applications, but where it really excelled was in the graphics department. Its 128MB Nvidia Geforce Go 6600 graphics card notched up a score of 1,739 in 3Dmark05, enough to humble most submissions in this group.

Unfortunately, despite it using the same 2GHz CPU as the Acer and Asus notebooks, it could only manage a Sysmark 2004 score of 154.

At nearly 3kg, you won't be carrying the Voyager C510 for long periods of time. Its 15.4in widescreen display also contributes to its bulk, but it has a widescreen aspect ratio and a native resolution of 1,680 x 1,050 – ideal for watching DVD movies. Its substantial frame means Evesham has been able to incorporate shortcut keys for launching an email client and web browser.

Like many of the entries in this group, the Voyager C510 comes with an 80GB hard drive. This should be adequate for most users, but if you want additional storage, the Panasonic DVD-RW dual-layer optical drive can be replaced with a second hard disk.

Arguably the best thing about this notebook is its price. At just £1,173, it is one of the least expensive Sonoma models we've seen.

DETAILS

RRP £1,173.83 (£999 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Evesham 0870 160 9500

www.evesham.com

PROS Graphics performance;

value for money

CONS Bulky

VERDICT

Still a great example of what can be done with the next generation of Centrino

FEATURES

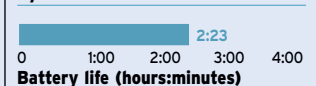
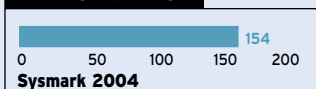
PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

It wouldn't be fair to compare it directly with the other notebooks in this group, since it wasn't tested under the same conditions but, despite an influx of challengers, Evesham's debut Sonoma laptop stands up as an excellent product.

PERFORMANCE



What is Sonoma?

Just over two years ago, Intel announced Centrino, a technology it claimed would provide notebook PCs with substantial wireless communication capabilities, better performance, and longer battery life. The second generation of the Centrino platform – codenamed Sonoma, promises even more improvements, but what is the technology behind it all, and what does it mean for you as an end user?

Intel 915 Express

The first major difference between the new and old platforms is the introduction of the new Intel 915 Express chipset. This has a number of improvements over the older 855 chipset, including support for processors with a fast

533MHz front-side bus (FSB). This gives a system based on next-generation Centrino technology a potential 33 per cent increase in bandwidth (see PCmark 2004 graph below).

CPU and memory

In order to make the most of the faster FSB and qualify for status as a next-generation Centrino product, manufacturers have to supply their notebooks with one of the newer Pentium M CPUs, codenamed Dothan. These have a massive 2MB of cache memory and come in a range of speeds from 1.5GHz to 2.1GHz. Whereas previous Centrino processors had 77 million transistors, Intel's adoption of a 90nanometer fabrication process means Dothans can accommodate 140 million transistors on each CPU die. This allows them to process data more quickly, run at a lower operational voltage and consume less power. The new Centrino platform also supports dual-channel DDR2 memory. One of the key benefits of DDR2 is its ability to run at high speeds and low voltages, resulting in potentially longer battery life (see battery life graph below).

Battery life

Intel makes no great claims for improved battery life in the Sonoma platform. In practice, by reducing the power demands of processor and memory subsystems as explained above, it's managed to improve overall performance and the feature set without affecting battery life



compared to the previous Centrino platform. This can help manufacturers to reduce costs by using smaller capacity batteries while still achieving respectable battery life.

Graphics and sound

The 915 Express chipset comes in two main flavours. The first of these has an integrated graphics solution. Unlike the ineffective Intel Extreme Graphics 2 cards we're accustomed to seeing – the Graphics Media Accelerator 900 is a DirectX 9-compatible adapter that allows even the humblest of new Centrino notebooks to play demanding 3D games.

The second chipset allows manufacturers to use a discrete graphics adapter of their choice. Intel has also added an updated sound processor that provides high-definition audio and support for Dolby Technologies such as Pro Logic II. This makes it

possible to listen to stereo music in 7.1-channel surround sound. See the 3Dmark graph below to see the results produced by a Sonoma compared to an older-generation Centrino laptop.

Connectivity

Whereas previous Centrino notebooks were restricted to using standard input/output connectors such as USB or Firewire, the next generation of notebooks will also support PCI Express peripherals. There aren't any available at present, but the technology could eventually replace the Type II PC Card.

The high data throughput allowed by PCI Express technology lends itself well to applications where bandwidth is crucial, such as video editing. Next-generation Centrino also supports Serial ATA (Sata) hard disks. Previous notebooks had a maximum data rate of just 133Mbytes/sec, but Sata drives can work at 150Mbytes/sec.

Wireless networking

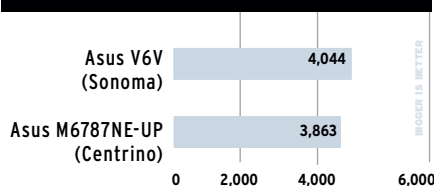
One of the major selling points of Centrino was its wireless capability, which has also been updated. Sonoma notebooks are now compatible with the 802.11a wireless standard as well as 802.11b/g.

This gives you flexibility to connect to any type of Wifi network. New Centrino notebooks also feature Gigabit Lan adapters – which operate at 1,000Mbps/sec – 10 times faster than previous notebooks.

Buying Sonoma

Although the two are quite different, Intel has chosen to use the same name for the second iteration of the Centrino platform. This could potentially be very confusing for the consumer, as you could end up buying outdated technology. If you are considering buying a new Centrino notebook, we recommend you ask the manufacturer whether it uses an Intel Pentium M 760 processor and the Intel 915 Express chipset, as these are sure-fire ways of telling whether you are buying a Sonoma system.

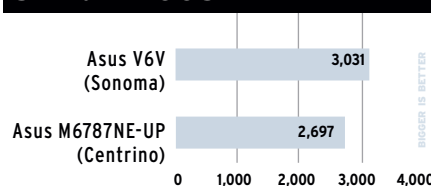
PCmark 2004



This graph shows that a notebook using the Sonoma platform offers superior performance over an equivalent rival using the original Centrino platform.

The Asus M6787NE-UP uses the Intel 855GM chipset, whereas the Asus V6V uses the newer Intel 915 Express chipset

3Dmark 2003 (1,024 x 768 at 32bit)



This shows the progress Intel has made with its Graphics Media Accelerator 900 platform. It delivers better performance than the ATI Radeon 9700 adapter in the Asus laptop and, as it is an integrated solution, implementing it in a notebook costs less than a separate graphics card.

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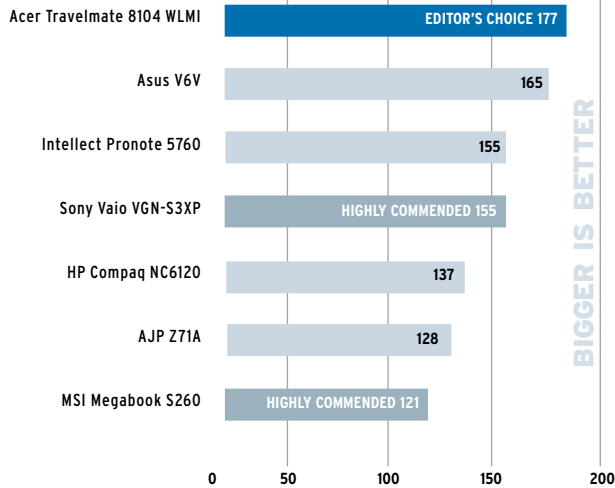
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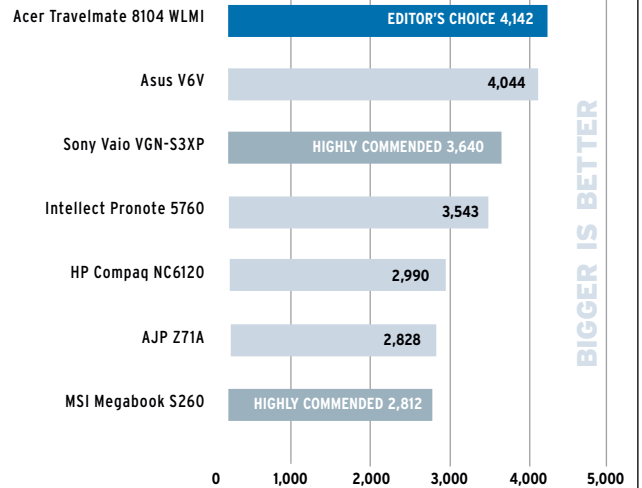


Lab results

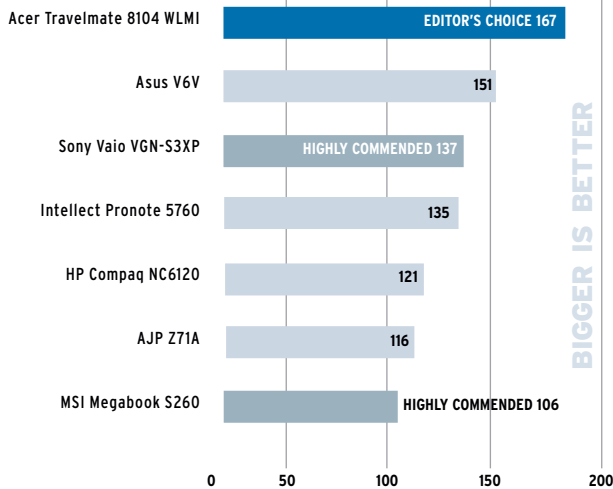
Sysmark 2004



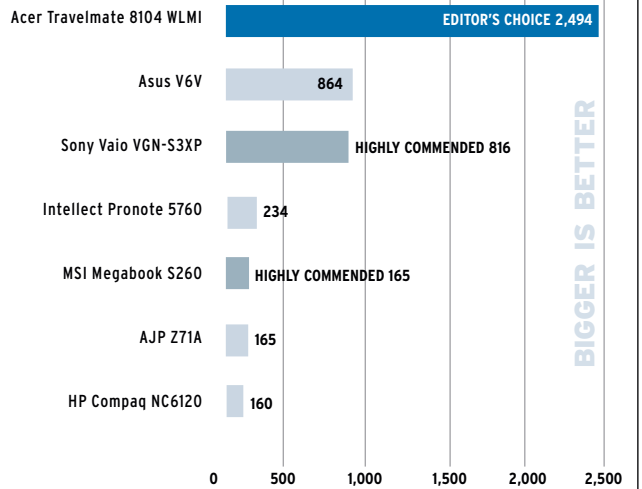
PCmark 2004



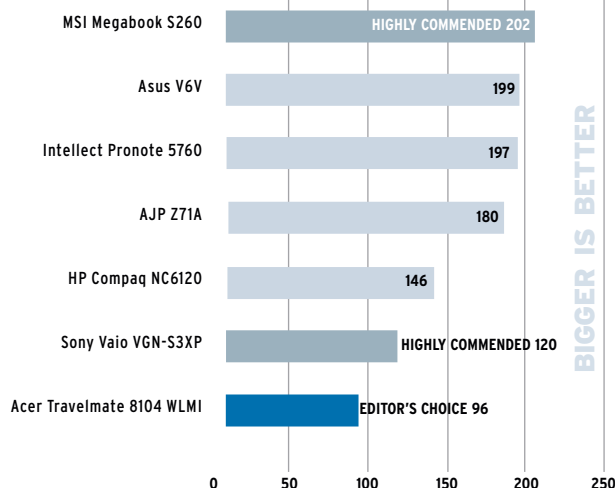
Sysmark 2004 office productivity



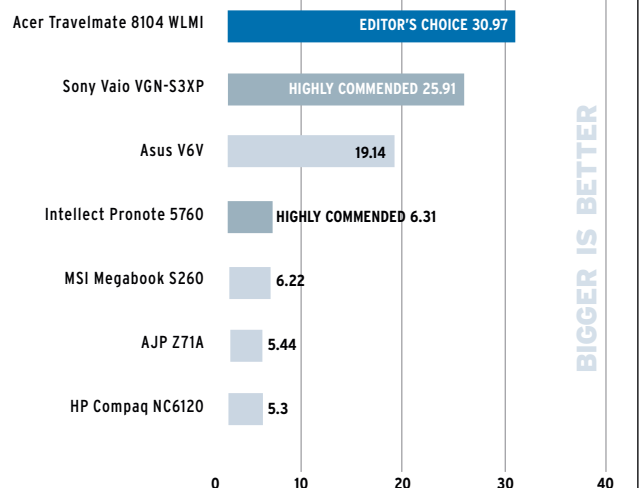
3Dmark05 (1,024 x 768 at 32bit)



Battery life (minutes)



Far Cry (fps) (1,024 x 768)



Please see page 12 for an explanation of how we tested the PCs









Table of features



MANUFACTURER	ACER	AJP	ASUS
MODEL	TRAVELMATE 8104	Z71A	V6V
Price inc VAT (ex VAT)	£1,499 (£1,276)	£851.88 (£725)	£1,599 (£1,360)
Sales telephone	0870 900 2237	020 8208 9755	0870 900 2237
URL	www.acer.co.uk	www.ajp.co.uk	www.asus.com
HARDWARE SPECS			
Processor	Intel Centrino Sonoma Pentium M 760 (2GHz)	Intel Centrino Sonoma Pentium M 760 (1.6GHz)	Intel Centrino Sonoma Pentium M 760 (2GHz)
Chipset	Intel 915PM	Intel 915GM	Intel 915PM
Available memory/type	1GB DDR2 400	512MB DDR333	512MB DDR2 400
Occupied/spare memory (Ram) slots	2/0	2/0	2/0
Max memory in this configuration	1GB	2GB	512MB
Hard disk manufacturer and model	Toshiba MK8026GAX	HTS541080G9AT00	Hitachi HTS541060G9AT00
Hard disk size	80GB	80GB	60GB
No of Express card slots	1	0 (blanked out)	0
No of PC Card slots	1	1	1
No of Firewire/serial/parallel/PS/2 ports	1/0/0/0	1/1/1/0	1/0/0/0
No of USB ports	4	5	4
MULTIMEDIA			
Optical drive	HL-DT-ST DVD-Ram GSA-4080W	TSSTCorp CD/DVD TS-L532A	DVD-/+RW/CD-RW
Optical drive formats and maximum speed	8x DVD-Super Multi Double Layer	24x CD-R ZCLV, 24x CD-RW ZCLV, 8x DVD-R ZCLV, 4x DVD-RW ZCLV, 8x DVD+R ZCLV, 4x DVD+RW ZCLV, 2.4x DVD+RDL CLV, 24x CD-Rom, 8x DVD-Rom	8x DVD-/+, 4x DVD-/+, 24x CD-R, 10x CD-RW
Sound chip	Realtek AC97	Realtek AC97	Realtek AC97
Graphics chip/memory	ATI Radeon X700/64MB	Integrated Intel 915GM graphics	ATI Mobility Radeon X600/64MB
Screen size and (maximum resolution)	15.4in widescreen (1,680 x 1,050)	15.1in 1,280 x 800	15in (1,024 x 768)
OTHER INFORMATION			
Misc hardware/modem	Bluetooth, 5-in-1 card reader, V.90 modem	V.90 modem	V.90 modem
Wireless technology	802.11a/b/g	802.11a/b/g	802.11a/b/g
Weight (kg)	2.86	2.9	2.6
Dimensions (w x d x h) in mm	363 x 266 x 31	357 x 276 x 35	331 x 272 x 30
Battery type/capacity	Li-Ion 14.8v 4,800mAh	Li-Ion 14.8 4,400mAh	Li-Ion 14.8v 4,800mAh
Operating system	Windows XP Home	Windows XP Home	Windows XP Pro
Bundled software	Acer Launch Manager, Acer Emanager, Acer System Recovery CD, Norton Antivirus, Adobe Acrobat Reader, Cyberlink PowerDVD, NTI CD-Maker, Acer Gridvista, Platinum Secret Suite	Panda Internet Security, Nero 6 OEM Suite 3	Three games, Nero, Asus DVD, Powerdirector, Mediashow 2
Standard warranty	1 year C&R	3 years RTB, years 2/3 Labour only	2 year global warranty, C&R
SCORES			
Features	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★

* RTB = return to base, C&R = collect and return

For the best Sonoma laptop prices go to www.pcw.co.uk/bestprices

			
HP COMPAQ	INTELLECT	MSI	SONY
NC6120	PRONOTE 5760	MEGABOOK S260	VAIO VGN-S3XP
£938 (£799)	£1,245.50 (£1,060)	£899 (£765)	£1,800 (£1,534)
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www.hp.co.uk	www.intellect.uk.com	www.msi.com.tw	www.sony.co.uk
Intel Centrino Sonoma Pentium M 760 (1.73GHz)	Intel Centrino Sonoma Pentium M 760 (2GHz)	Intel Centrino Sonoma Pentium M 760 (1.6GHz)	Intel Centrino Sonoma 915PM 2GHz
Intel 915GM	Intel 915GM	Intel 915PM	Intel 915GM
512MB DDR333	1GB DDR2 533	512MB DDR333	1GB PC2-3200 DDR2 400
1/0	2/0	1/0	2/0
512MB	1GB	512MB	1GB DDR2 SD-Ram
Fujitsu MHT2060AH PL	Fujitsu MHT2080BH	Hitachi HTS541080G9AT00	Fujitsu MHT2080BH
60GB	80GB	80GB	80GB
0	1	0	0
2	1	1	1
1/0/1/0	1/0/0/0	1/0/0/0	0/0/0/0 (1 link port)
4	3	5	2
HL-DT-ST DVD-RW GWA-4080N	QSI DVD+-RW SDW-082	TSSTCorp CD/DVD TS-L532A	Matshita UJ-822Da
8x DVD-Super Multi Double Layer	8x DVD-R, 4x DVD-RW, 8x DVD+R, 4x DVD+RW, 24x CD-R, 24x CDR-W, 24x CD-Rom, 8x DVD-Rom, 2.4x DVD+RDL	24x CD-R ZCLV, 24x CD-RW ZCLV, 8x DVD-R ZCLV, 4x DVD-RW ZCLV, 8x DVD+R ZCLV, 4x DVD+RW ZCLV, 2.4x DVD+RDL CLV, 24x CD-Rom, 8x DVD-Rom	12x CD-RW, 4x DVD-RW, 4x DVD+RW
Soundmax	Realtek AC97	Realtek AC97	Realtek High Definition
Integrated Intel 915GM graphics	Integrated Intel 915GM graphics	Integrated Intel 915PM graphics	Nvidia Geforce Go 6200
14.1 (1,024 x 768)	14.1 (1,024 x 768)	12.1 (1,280 x 800)	12.1in (1,280 x 800)
5-in-1 card reader, V.90 modem	4-in-1 card reader, V.90 modem	Notebook bag, V.90 modem	Memory Stick Pro reader, Port replicator (vgp-prs2), V.90 modem
802.11a/b/g	802.11a/b/g	802.11a/b/g	Bluetooth/802.11a/b/g
2.8	2.8	2.15	1.95
329 x 267 x 30	330 x 280 x 36	303 x 225 x (26-28)	320 x 220 x 29
Li-Ion 10.8v 4,800mAh	Li-Ion 14.8 4,400mAh	Li-Ion 8 cell, 4,400mAh	Li-Ion 11.1v/4,800mAh
Windows XP Pro	Windows XP Pro	Windows XP Home	Windows XP Pro
HP ProtectTools Security Manager: Bios Configuration for HP ProtectTools, Credential Manager for HP ProtectTools, HP Wireless Assistant, Sonic RecordNow (for optional DVD+/-RW and DVD/CDRW drives), Symantec Norton Antivirus with complimentary 60-day live update, Intervideo WinDVD - DVD Player (for optional DVD+/-RW, DVD/CDRW and DVD drives)	Microsoft Office 2003 Professional	Cyberlink Software bundle, Norton Internet Security 2004	Sonicstage 2.1, Sonicstage Mastering Studio 1.4, Moodlogic 2.5, Vaio Media 3.1, Record Now 7.3, Click to DVD 2.2, Adobe Acrobat 6 Professional Try & Buy, Adobe Acrobat Elements 6, Adobe Reader 6, Microsoft Works 8, Adobe Photoshop Album Starter Edition, Adobe Photoshop Elements 2, Picturegear Studio 2, Norton Internet Security 2005, Norton Password Manager 2004, Vaio Update 2.1, Utimaco Safeguard Privatedisk easy, Vaio Recovery Utility, Adobe Premiere Standard, DVgate Plus 2, Vaio Edit Components 5, WinDVD 5.0 for Vaio, Vaio Zone 1.2
1 year parts and labour	2 years RTB	2 years C&R	1 year RTB
★★★★★	★★★★★	★★★★★	★★★★★
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★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★

Vendors of group test products are only obliged to sell them at the prices quoted here (which include delivery and credit card surcharges) for the life of this PCW issue. They may also change components under certain circumstances.

> Editor's Choice

We've looked forward to conducting a group test of next-generation Centrino notebooks for some time now. Not specifying a budget or target audience meant we could look at a wider range of submissions and show how different vendors interpret the technology.

On the whole, we were impressed, but there were some entries that disappointed. The HP Compaq NC6120 serves its purpose well, and has some excellent features that should help the business user. Unfortunately it doesn't make the most of the next-generation Centrino platform – mostly because it uses standard DDR memory.

We also had mixed feelings about AJP's Z71A. It is a capable notebook, but we have to question whether it was wise to deliver a specification that could alienate two sets of users. It is too large to be considered an ultraportable and doesn't have the performance usually expected from a desktop replacement.

The Intellect Pronote 5760 suffers a similar fate, but is helped significantly by its fast processor and a number of options for connectivity. It is also one of two notebooks here with an Express Card slot. Admittedly, there aren't any cards available that take advantage of this feature, but it gives the Pronote 5760 a degree of future proofing.

'Unless you are a basic user, you should buy a Centrino laptop'

The winners

Our first **Highly Commended** award goes to the **Sony Vaio VGN-S3XP**. At just 1.95kg, it is the lightest entry, making it one of the best candidates for users who are often on the move. Its 12.1in display is small, but it delivered bright pictures, excellent contrast, and its widescreen aspect is great for DVD movie playback.

It is unusual for a notebook of this size to feature a discrete graphics adapter, but by squeezing in an Nvidia Geforce Go 6200, Sony has given the Vaio VGN-S3XP substantial graphics-processing power. It doesn't have the extreme polygon-handling capabilities of the Acer Travelmate 8104 WLMI, but it will happily run Far Cry at high resolutions with all the graphics detail



Acer Travelmate 8104 WLMI



MSI Megabook S260



Sony Vaio VGN-S3XP

turned on. Just be careful it doesn't burn your lap – this notebook can get quite hot.

Our second **Highly Commended** award goes to the **MSI Megabook S260**. Its large and unusually designed battery just pushes it over the 2kg mark, but it is one of the smallest notebooks we've seen and lends itself well to being taken on the road.

It is by no means the most powerful notebook in the group, but its 1.6GHz processor and 512MB of memory are more than capable of handling everyday tasks such as word processing or surfing the web. It can handle more demanding applications such as 3D games, but its integrated Intel graphics adapter isn't best suited to this.

The Megabook S260 makes up for a comparative lack of performance with its very long battery life. The battery lasted almost three and a half hours during our intensive tests and should last far longer when performing everyday tasks such as word processing. This makes it an ideal notebook for users who intend to travel a great deal.

Our **Editor's Choice** award winner is the **Acer Travelmate 8104 WLMI**, which impressed us inside and out. Its 2GHz CPU doesn't sound like much, particularly in comparison to a fast desktop processor, but in conjunction with the 1GB of DDR2 memory, this notebook notched up a remarkably high benchmark score. It isn't as quick as the fastest desktop PCs, but its performance is streets ahead of the sub-£500 PCs we looked at in last month's group test.

The Travelmate's multimedia capabilities are excellent. Gamers in particular will be pleased at the inclusion of an ATI Radeon X700 graphics card, which helped propel Far Cry at over 30fps at a resolution of 1,024 x 768.

The 8104 WLMI is also a very good device if all you want to do is produce a few Word documents. It is the only notebook here that has an ergonomically curved keyboard. Whereas some ergonomic desktop keyboards can be difficult to get used to, Acer's interpretation feels completely natural.

We are impressed with the next generation of Centrino technology, which provides a significant improvement compared to the original platform.

We recommend that if you plan to buy an Intel laptop, you should go with a Centrino, unless you are a basic user who will never need to wirelessly connect to the Internet or require extended battery life.

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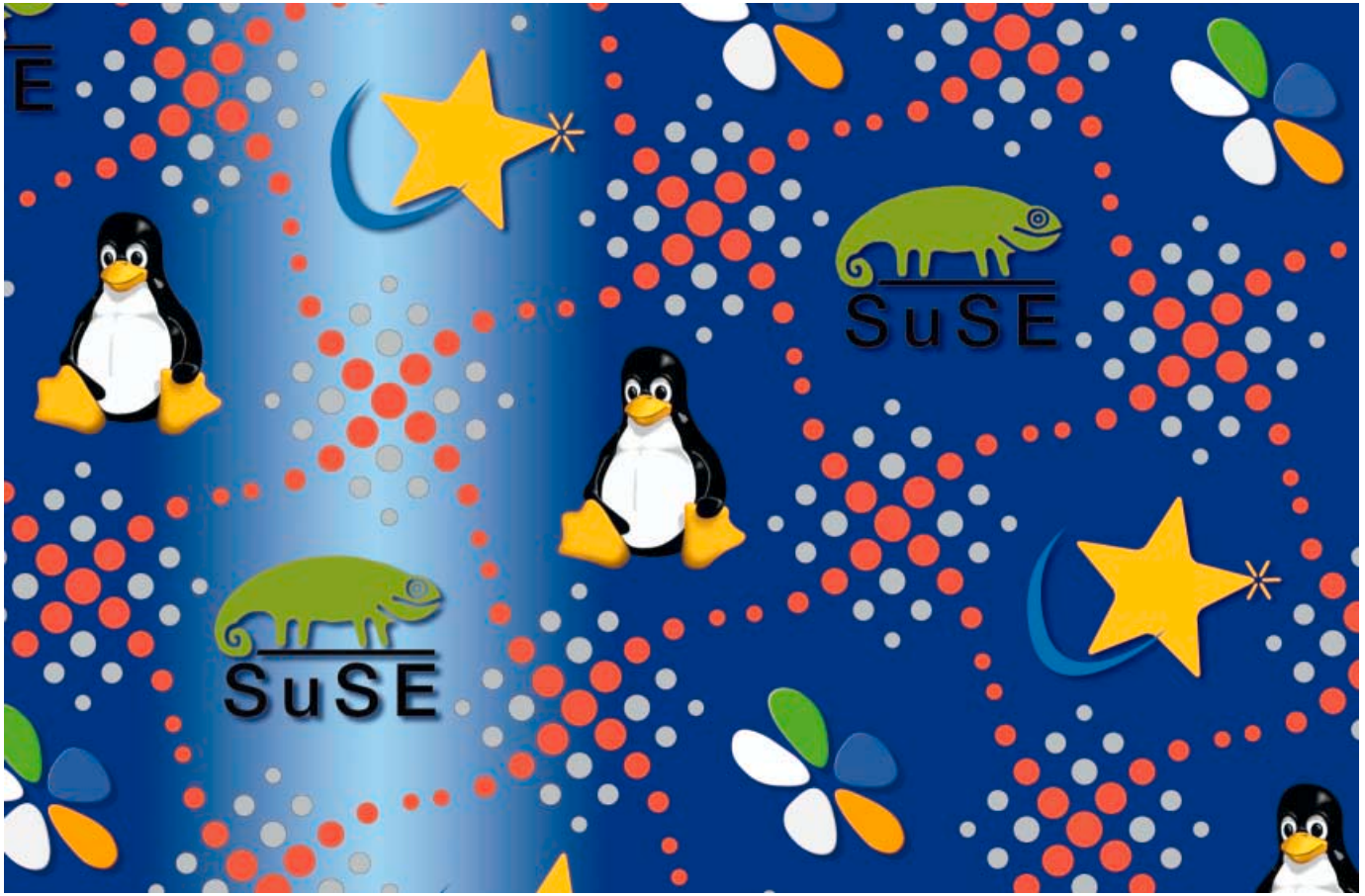
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CONTENTS

- 122** Fedora Core 3
- 123** Lycoris Desktop/LX 1.4
- 124** Mandrake Linux Power Pack 10.1
- 125** Suse Professional 9.2
- 126** Xandros Desktop 3 Deluxe
- 127** Table of features
- 129** Editor's Choice

Linux leaders

WORDS: BARRY SHILLIDAY

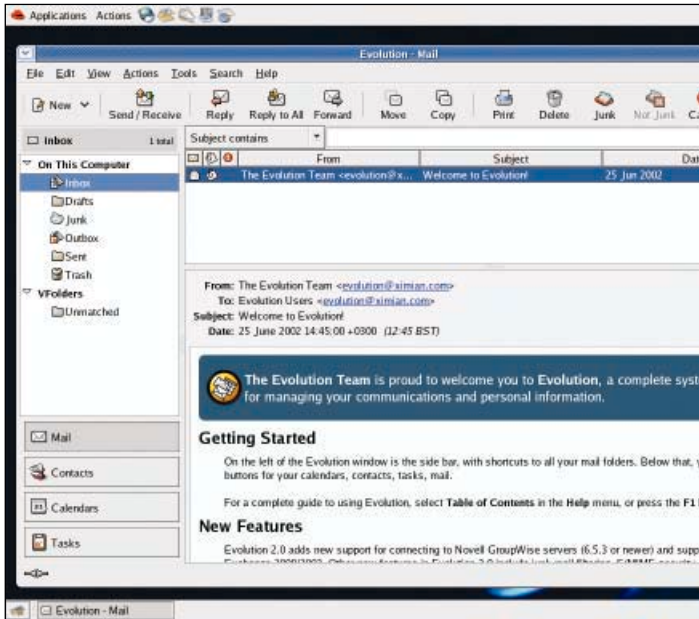
Linux can offer a great alternative to Windows or Mac operating systems, but choosing the right distribution can be confusing. We put five market leaders to the test

When you buy a PC with Windows XP you know exactly what you're getting. Similarly, when you run an Apple Mac you have OSX. But when it comes to Linux, it's not so simple. Since no single organisation controls Linux, companies choose a selection of applications and utilities, provide custom configuration and installation tools and bundle them together in what's known as a Linux distribution. In this group test we're going to look at five of the leading consumer distributions. Some are free to download and distribute, others you need to buy.

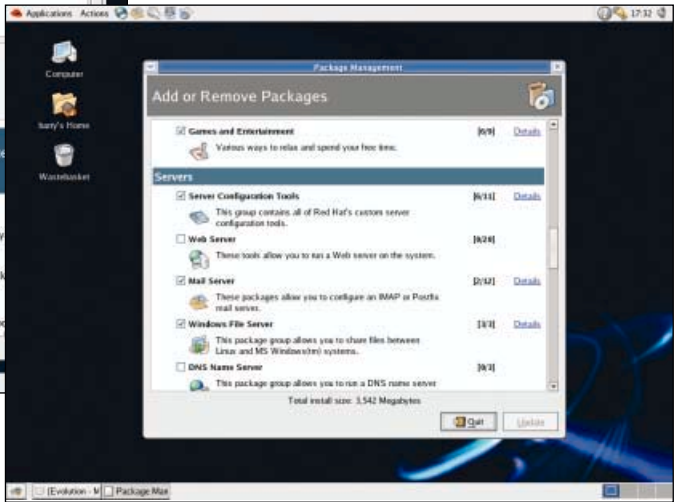
You don't have to stick with XP or OSX – there are many reasons to run Linux. It could be used as a desktop replacement for your

home PC, for browsing the Internet, sending emails and downloading pictures from your digital camera; or it could be a secure, reliable office workstation operating system, making use of high-quality free software such as Open Office and Mozilla Firefox. You might use it as an email or web server that simply sits quietly in the corner of a room, or it could be used as a combination of all these.

A good distribution has the potential to serve any of these functions, although each may favour one particular need above the rest. Our selection of five distributions (chosen to give you a taster of what's available) are all consumer-orientated, so should have some focus on the home and business desktop. All cost between the price of a download and £70 – including all the applications.



Left: Fedora Core's email is provided by Novell Evolution, which can connect to Microsoft exchange servers



Below: Several servers are provided

Fedora Core 3

Back in November 2003 Fedora Core made its initial release. This came a couple of months after Red Hat decided to discontinue its popular consumer distribution, Red Hat Linux, and concentrate on enterprise solutions. Fedora Core was developed from the final release of Red Hat Linux, and is now in its third version. It is the only distribution in our group test which has no commercial version available.

Fedora Core's predecessor had been the most dominant Linux distribution out there and, with such a base to build upon, it's not surprising that Fedora Core maintains its position as one of the most popular distributions. The goal of the project is to release a new version every six months, thus giving a modern but stable system to run.

Installation is smooth and simple. A consistent, well-defined look greets you as you progress through the various stages. After choosing the language, the disk can be configured using an automatic system or manually with 'Disk Druid', the partitioning software. There's a limited choice of filesystems, but it's possible to configure software Raid and logical volumes with ease, and we found this to be

one of the best partitioning systems of all. A choice of default software selections is offered; this is easily configured during or after the installation. Next comes the network set-up. The firewall is on by default, and there are options to open up ports for services such as a webserver. After a reboot, there are a few more installation steps to go through, such as adding a user and configuring the graphics card. All worked flawlessly, and the installation's balanced simplicity overall was impressive.

Having logged in, you're presented with an attractive Gnome desktop. Red Hat's desktop theme, Bluecurve, is fully integrated, giving a satisfying professional look to everything. The menus are well-laid out, although if you chose to install the KDE desktop they can become a little cluttered.

Email is provided by Novell Evolution, a mature application which can also connect to Microsoft Exchange servers. Mozilla Firefox provides the web browsing. Thunderbird is available for news and email as well, but it's not installed by default. Open Office, tailored to the Fedora look, is more than capable of office work and is ready to go. Basic CD writing is

built into the file browser and KDE's K3b is available as an optional extra.

Multimedia support has never been a strong point of Fedora Core. As a completely free project, no proprietary software is included. As a result, there's no support for common video formats or mp3 files and there are no Java or Flash plug-ins for web browsing. Some improvements have been made however, and clicking on an mp3 file points you to a download of Realplayer, which is easily installed and adds support for most audio formats and Real's video codecs.

A number of servers are available, including those for Windows networking, NFS, email and the web. There are some simple graphical utilities to configure these - they work well, but don't compare to Suse's equivalents. Unlike some others, Fedora Core doesn't have a central configuration application.

You can easily install extra software from the discs through a system utility, although if you are not installing from the DVD it can mean many unnecessary disc swaps. There's a tool to keep the system up to date, but the sheer number of updates needed makes this impractical for anyone not connected by

broadband; we had to download well over 200MB.

Although lacking in some respects compared to the others, Fedora Core's history means that downloading and installing the extras is simple and there are a number of Internet sites offering third-party downloads to fill in the gaps.

Fedora Core is available for both 32 and 64bit platforms, and fits on four CDs or one DVD. All versions are freely available to distribute and download. To avoid large downloads, some vendors offer pressed CDs and DVDs for sale.

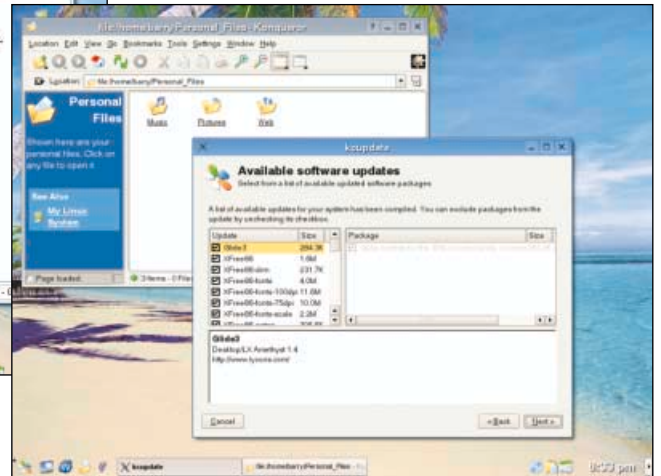
DETAILS

RRP Free
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
 Fedora fedora.redhat.com
SYSTEM REQUIREMENTS
 Pentium II 400MHz • 128MB of Ram
 • 5GB disk space
PROS Stable and solid
CONS Poor multimedia support
VERDICT
A good all-round, stable system, but limited multimedia capabilities

FEATURES ★★★★★
EASE OF USE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



Left: The Desktop/LX menus are clearly structured and well-labelled



Below: It is possible to locate software updates from a gallery

Lycoris Desktop/LX 1.4

Desktop/LX, from American company Lycoris, differs from the other distributions on test in that it aims purely at a home desktop market and attempts to produce a system anybody can use, even if they have no understanding of Linux. To that end, it's a small distribution, coming on only one CD. The standard edition offers no development tools or servers and concentrates on having enough software to perform day-to-day tasks.

The installation has a very Windows 98 feel, but is quick and easy to do. Technical questions are avoided, using the plainest English possible, and the graphics card section lets you choose all the common resolutions and refresh rates you could want. After completing minimal set up information, the installer presents you with a

card game to play while the install proceeds. Following the first reboot, a custom splash screen takes you into a modified KDE desktop. Lycoris has licenced font-rendering technology from Bitstream, so fonts look a little different in Desktop/LX compared to other distributions. The overall look and feel is influenced by Windows XP, presumably to make it familiar to new users. It includes a customised control centre and various wizards to get things working. Lots of effort has gone into the desktop; menus are clearly structured and well-labelled with icons. There's also a utility to browse the PC's hardware and local network, also reminiscent of Windows XP.

Desktop/LX runs on the older 2.4 series of Linux kernel releases. The disadvantage is that hardware support will not be as wide; our onboard network card was not detected and we had to manually install a module obtained from

The look and feel of Desktop/LX is influenced by Windows XP

Lycoris support. There's little in the way of system configuration tools, mainly because of the lack of server software. The control centre, however, does provide enough for most tasks – adding users, changing the monitor settings and so on.

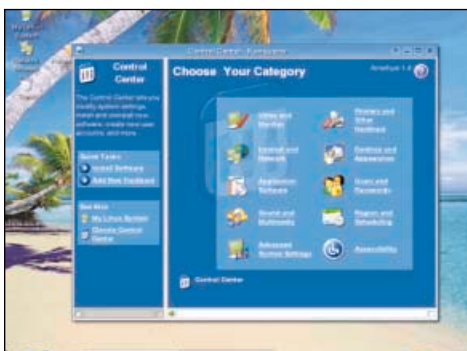
A big let down is the exclusion of Open Office. This free office suite, easily rivalling Microsoft Office, is an expected part of any Linux distribution. Included instead is Koffice, a small KDE office suite which is suitable for small tasks but cannot compare to Open Office. Lycoris intends to sell a separate package with a modified Open Office, but this is already included with most rival distributions.

For multimedia and general use, Desktop/LX has some impressive capabilities. The customised Mozilla web browser has plugins for Java, Realplayer and Adobe Acrobat; many audio and video files play back without a problem. The video player is listed as working with mpeg4/divx clips, although we were unable to get these to play.

The software on the CD may be limited, but Desktop/LX could make a good replacement for Windows 98 systems. Additional applications can be obtained via Iris, an online gallery of selected software. The choice of applications isn't huge,

but each has been configured to run on Desktop/LX specifically. For keeping everything up to date, a tool is provided. It doesn't give information about why the updates are required but it automates their download and install without fuss.

Desktop/LX is available in a standard version (reviewed here) at \$40 (£21 approx), or a Deluxe edition that costs an extra \$10 (£5). This includes two additional CDs: one for development utilities and one for source code. Either can be downloaded for a discount of \$5, but there is no free downloadable version.



DETAILS

RRP \$40 (£21 approx) download

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Lycoris www.lycoris.com

SYSTEM REQUIREMENTS

Pentium II 400MHz • 128MB of Ram

• 2GB disk space

PROS Very simple and

easy-to-use system

CONS Openoffice is not supplied

VERDICT

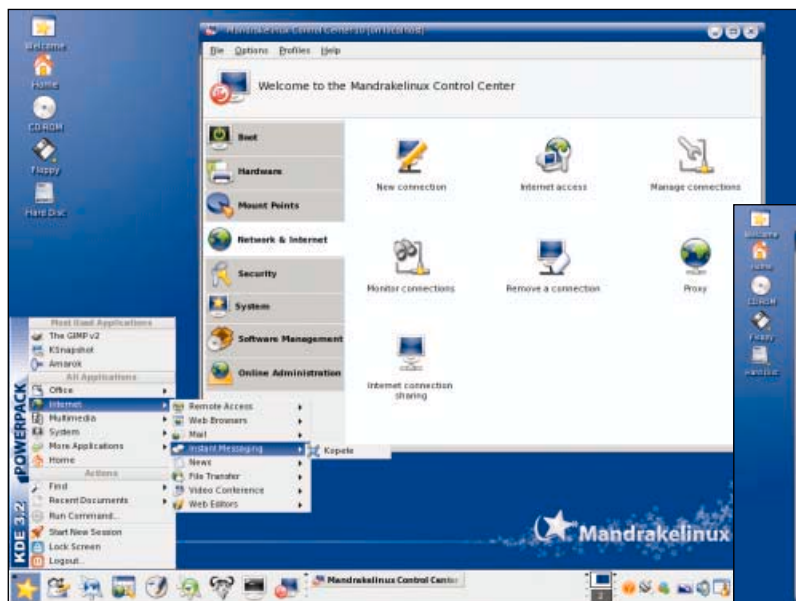
A good replacement for Windows 98, but rather basic

FEATURES ★★★★★

EASE OF USE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



Left: Mandrake's control centre is an elegant application for centralised configuration



Below: Kmail is the default email application

Mandrakelinux Powerpack 10.1

French company Mandrakesoft almost disappeared last year, heading towards bankruptcy. Fortunately it managed to pull through, and the company continues to sell its Mandrake Linux product line. Here, we're looking at the latest boxed Powerpack 10.1 edition.

Like Fedora, Mandrake Linux was originally based on Red Hat Linux, but the connection and similarity has all but disappeared. It now shares a similar market with Suse – a general environment, suitable for servers, workstations and home PCs, although Mandrake's offering is slightly more home-desktop orientated than its long-running competitor. The Powerpack comes with two high-quality printed manuals and six CDs. Unfortunately, there isn't a DVD included; this was particularly noticeable when adding a piece of software required four CD changes.

The installation is reasonably easy to perform. Its appearance is somewhat ugly and dated, especially compared to Fedora's, but it gets the job done. The partitioner makes good sensible decisions and supports a variety of configurations, although it does not allow for software Raid. A selection of package types is offered, such as games and

development tools and the default selections are well-chosen. The system can be set to auto-login as a user, complete with a picture, similar to Windows and OSX. After the packages are installed, there's an option to download the latest updates, but this failed on our test PC without giving an error message.

Once booted up, the graphical system starts smoothly. Nvidia and ATI drivers are already included, making life easier and giving good performance. Mandrake has always favoured the KDE desktop and there's no exception here; the Galaxy theme Mandrake uses is pleasant, although it is not quite up to Fedora's or Suse's efforts. The Gnome desktop is provided on the CDs should you prefer to use that instead.

A good basic set of applications is provided, meaning the menus are clean and easy to navigate. Oddly, Mozilla is not installed by default, and Mozilla Firefox is not available at all. Plug-ins for Flash, Java and pdfs are all ready to use. Open Office is configured well; it was even ready with UK local settings on the first run. For multimedia use we were impressed: mp3s and other popular music formats play perfectly and even mpeg4

video (such as Divx) plays without a hitch. Generally there are applications ready to run any kind of standard file you can click on, making Mandrake a great choice for beginners to Linux.

System configuration can be performed with the centralised utility Drakconf. Here there are various options for controlling hardware, the network, users and software. Drakconf is an elegant piece of software and we had no problem making changes with it. The update procedure was slow but completely straightforward: updates are divided into three categories, and each one has a description of the problem fixed.

There are disappointments. Removable hardware support appears to be very limited: nothing happened when we inserted a USB pen drive, even though the device is fully supported by the operating system. When we plugged in a Bluetooth device there was no response, although a utility was hidden away on the discs that would enable its use. Updating the kernel (the core of the operating system) has to be performed manually, something not attractive to new users. There is no easy access to network shares from the desktop or any

way to configure Windows shares. Plenty of server software is provided, but there are few utilities to make configuring these simple.

Mandrake Linux is available in several versions, including a free-to-download edition. The Powerpack edition retails at €79 (£55 approx) and includes 60 days' web support. Also available is the three-disc Discovery edition at €44 (£30), although this lacks a large amount of useful software, even compared to the free version. A 64bit version is available, but cannot be downloaded free of charge.

DETAILS

RRP €79 (£55 approx); €44 (£30)

Discovery version

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Mandrake www.mandrakelinux.com

SYSTEM REQUIREMENTS

Pentium II 400MHz • 128MB Ram

• 5GB disk space

PROS Easy to use

CONS Server software lacks

configuration utilities

VERDICT

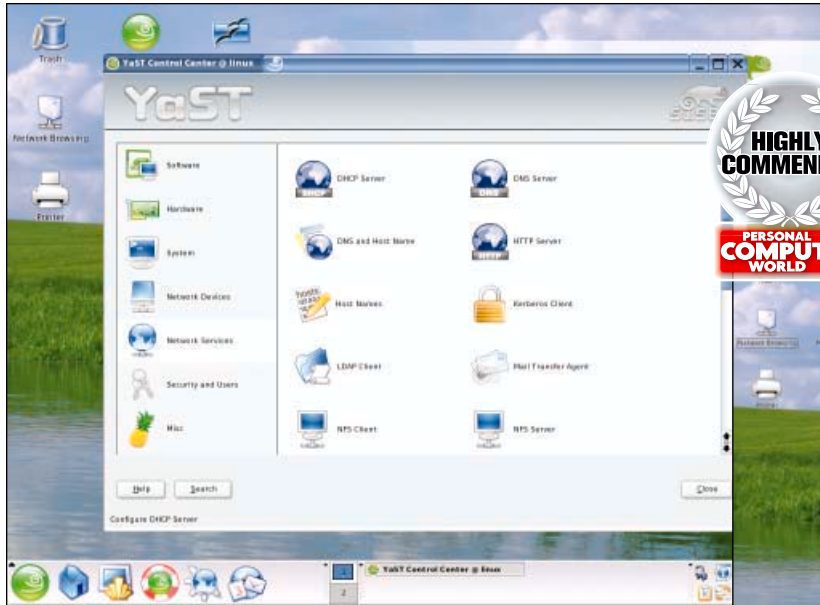
A good all-round system, ideal for those new to Linux

FEATURES ★★★★★

EASE OF USE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



Left: Yast is an enormously flexible configuration tool, although it's a little dated



Below: Suse has a well put together desktop interface



Suse Professional 9.2

Despite being recently acquired by Novell, the Suse Linux brand remains the primary platform for Linux products from the new owner. Little has changed from previous releases, apart from a discrete Novell logo on the corner of the box. Novell offers a cut-down version of Suse, called Novell Linux Desktop, but it's the larger Suse Professional we're looking at here.

Since Red Hat has pulled out of the commercial distribution market, Suse is now the largest brand in terms of financial backing. Suse Professional aims to be suitable for all purposes – be it business or home. It's certainly the largest on test, coming on six CDs and two DVDs. Also provided in the box are two excellent manuals; Suse's reputation for documentation has always been high.

Installation is performed by Yast, which is also the centralised set-up tool for when the system is up and running. The process is a little more complicated than others, but offers an enormous amount of flexibility. Uniquely, the installer gathers together recommended options and displays them in a list, rather than going through a linear

selection of choices. The final step allows you to download all the latest updates, giving you a fully up-to-date system before you've even finished installing. After rebooting and setting up a few more options, Suse presents you with an attractive and colourful KDE desktop; the best aesthetically we saw for KDE, rivalling Fedora's Gnome desktop. Looks aside, the desktop is well put together and the menus are clear, although some items were missing icons, somewhat spoiling the consistency.

Kmail is provided for email, with Novell Evolution as an option. Konqueror is there for web browsing, together with plug-ins for Java, Flash and pdf files. Mozilla Firefox, a better browser, is optional, although ideally it would be installed automatically. For office work there's a customised version of Open Office. Many hundreds of additional applications are available on the discs and can easily be installed with Yast.

Multimedia support is generally above average. Most audio formats, including mp3, are supported. Disappointingly, mpeg4 and many other video files are not supported as they are with Mandrake and Xandros. Digital cameras are well supported, and USB

flash drives pop up a window when inserted.

There's good news for users of laptops and wireless devices. Many laptops can enter standby and sleep modes. We were able to plug in a Bluetooth USB device and immediately transfer files to and from a mobile phone. A nice additional touch is that the power-saving mode for processors, including the desktop AMD Athlon 64, is automatically enabled and can be controlled by a panel applet. Some wireless Lan cards need firmware downloads that Suse cannot supply on the discs, but some of these can be downloaded directly through Yast.

Yast caters for all common administrative tasks, including user management and server configuration. We were impressed with the range of tools on offer. For example, with one mouse click you can set up a remote administration server, allowing you to log in to KDE from anywhere on the Internet, on any operating system. Updating the system is helped along by using patches instead of full package downloads. The packages are then built from the patches, potentially saving considerable time, especially for slow Internet connections.

An extra update allows you to download Microsoft's core Internet fonts, useful as many sites use these. The update tool isn't as well laid out as Mandrake's, but is otherwise more than satisfactory and gives you all the information needed.

Suse Professional retails at £65, including 60 days' installation support. It comes with a 64bit version on the DVD in addition to the regular 32bit version. There's also a student edition at £43, and a free-to-download Personal edition which is not available as a boxed set.

DETAILS

RRP £65 (€55 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Novell www.novell.com/

www.suse.co.uk

SYSTEM REQUIREMENTS

Pentium II 400MHz • AMD64/EMT64 for 64bit • 256MB of Ram • 5GB hard drive

PROS Great flexibility

CONS Complex installation

VERDICT

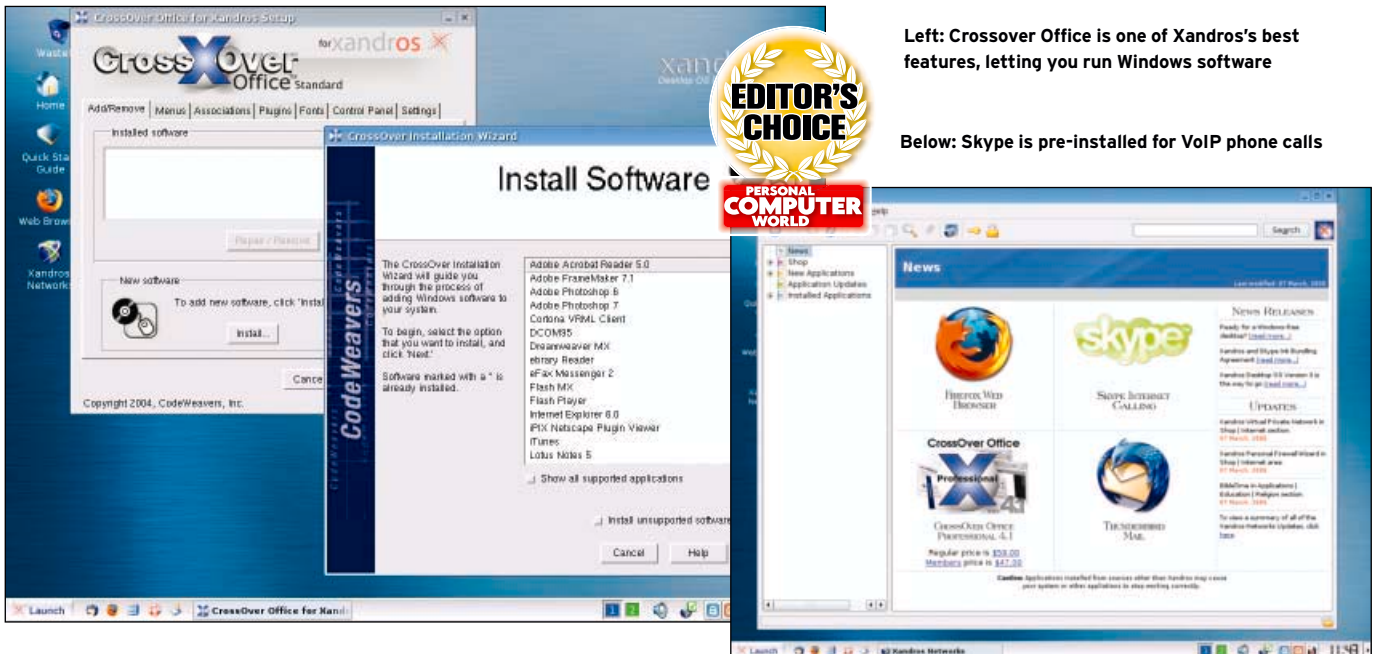
Suitable for just about any use, with lots of software available

FEATURES ★★★★★

EASE OF USE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



Left: Crossover Office is one of Xandros's best features, letting you run Windows software

Below: Skype is pre-installed for VoIP phone calls

Xandros Desktop 3 Deluxe

During the dot.com boom, Corel released its own Linux distribution. Now defunct, many of its developers joined Xandros and a new distribution was created with a strong focus on the desktop, especially home and business. The boxed Xandros Deluxe 3 comes on just two CDs: one for the core installation and another for additional applications, although only the first disc is required. Also provided is a short 'Getting Started' booklet and a more hefty well-designed user guide.

As a comparatively small distribution, the installation doesn't take long. The initial setup screens are lacklustre but the process is easy: appropriate defaults are offered with few places to make bad decisions. Windows-friendly names are used, giving switching users a

softer learning curve. But this simplicity comes at the expense of flexibility, as not many advanced options are available.

After rebooting, the system starts up the KDE desktop. Gnome isn't an option with just one installation CD, but Xandros has made changes to the standard KDE environment, focusing entirely on the one desktop. The appearance and feel is very professional. The look is reminiscent of Windows 2000, which makes it seem rather dated, but the menus are well laid out and it seems that a lot of time has been spent polishing the product to give it a finished feel.

The choice of applications is excellent, particularly when combined with the second disc. Open Office for office work, Mozilla Firefox for web browsing and Mozilla Thunderbird for email are included. Evolution is available for download, but it's an old version. Commercial applications are also provided, meaning the essential plug-ins

are set up. For multimedia purposes, all the popular audio formats are supported with mpeg4 and other video formats. We could even play the aac format used by Apple's Ipod.

Xandros has developed its own file manager, which replaces the standard one from KDE. It implements the same functionality as Windows Explorer, giving access to disk partitions, CD drives and so on. We had no trouble connecting to shares on Windows and Macs; another useful quality, especially for office users.

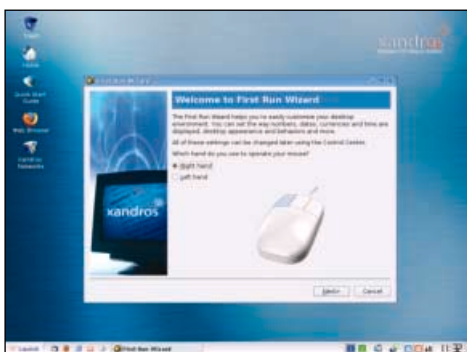
Skype is pre-installed for Voice over IP – something unique to Xandros so far – and Codeweavers' Crossover Office software lets you install and run many Windows applications such as Microsoft Office, Lotus Notes and Adobe Photoshop.

As a desktop system, few server applications are available, but lots of additional software can be installed via Xandros Networks, an online software repository. This is also used for updating the system and it works well. There are few utilities for administering the system although, on the first login, a wizard helps set a few common user settings. Also available is a useful firewall utility to allow certain ports to be open.

Due to incompatibility with the graphics card, problems arose

installing on our test PC. The other distributions on test didn't suffer the same problem, but a fix was provided by Xandros Support which will be in the next release.

Xandros Desktop is available in two boxed editions: Standard at \$49.95 (£25 approx) and Deluxe at \$89.95 (£47), with 30 and 60 days' support respectively. The Standard edition lacks the user guide, second disc and Crossover Office. Also available for download is a free Open Circulation edition, which is mostly the same as the Standard edition, minus a few features and commercial support.



A wizard will help you configure settings on the first logon

DETAILS

RRP \$89.95 (£47 approx) Deluxe

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Xandros www.xandros.com

SYSTEM REQUIREMENTS

Pentium II 400MHz • 128MB of

Ram • 2GB disk

PROS Excellent for home or office use

CONS Few server applications

VERDICT

For a user-friendly desktop OS, it's hard to beat






FEATURES ★★★★★

EASE OF USE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

Table of features

					
MANUFACTURER	FEDORA	LYCORIS	MANDRAKELINUX	SUSE	XANDROS
PROD	CORE 3	DESKTOP/LX 1.4	POWERPACK 10.1	PROFESSIONAL 9.2	DESKTOP 3 DELUXE
Price	Free	\$40 (€21 approx)	€79.90 (€56 approx)	£65 (€55 ex VAT)	\$89.95 (€50 approx)
URL	http://fedora.redhat.com	www.lycoris.com	www.mandrakelinux.com	www.suse.co.uk	www.xandros.com
Free Download Version	✓	✗	✓	✓	✓
Unrestricted Use	✓	✗	✓	✓	✗
Number of CDs/DVDs	4/0	1/0	6/0	5/2	2/0
Resize partitions	✗	✗	Fat/NTFS/Linux	Fat/NTFS/Linux	Fat/NTFS/Linux
COMPONENT VERSION INFORMATION					
Kernel	2.6.10	2.4.27	2.6.8.1	2.6.8	2.6.9
GCC	3.4	N/A	3.4.1	3.3.4	3.3.4
X11	X.Org	Xfree86	X.Org	X.Org	X.Org
Default desktop	Gnome 2.8	KDE 3.2	KDE 3.2	KDE 3.3	KDE 3.3
Evolution	2.0.2	N/A	2.0.3	2.0.1	1.4.6
Openoffice	1.1.3	N/A	1.1.3	1.1.3	1.1.2
Firefox	1.0.1	Mozilla 1.7.5	Mozilla 1.7.2	1	1
Gimp	2.2.3	2.0.2	2.0.4	2.0.4	2.0.5
MULTIMEDIA					
Java	✗	✓	✓	✓	✓
Realplayer	✗	✓	✓	✓	✓
Macromedia Flash	✗	✓	✓	✓	✓
Mp3 playback	✗	✓	✓	✓	✓
Mpeg4/DivX playback	✗	✓	✓	✗	✓
CD/DVD writing	✓	✓	✓	✓	✓
SCORES					
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Ease of use	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

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Editor's Choice

We've picked five of the most popular Linux distributions available. While Linux is suitable for a variety of tasks – anything from running the firmware on a mobile phone, to providing massive enterprise database solutions – we've looked at the consumer options for both home and the office. A good distribution needs certain important qualities: an installation that is flexible and not too difficult to perform and a reliable system with up-to-date applications. Security is certainly an issue too; a firewall should be in place to protect against attackers and an update utility must regularly check for new releases and make their installation simple. For home and business environments, connectivity is important – the system needs to connect to other computers reliably and without complicated configuration, and the distribution should provide an installation utility to co-exist with Windows software.

The winners

Xandros Desktop Delux 3.0.1 meets all these requirements and more and so receives our **Editor's Choice** award. The installation takes just a few minutes and each step is clearly explained. You can resize both NTFS and Fat partitions, making space on a computer where Windows is already installed. The desktop has a professional look to it and

'The Xandros File Manager works with just about all kinds of files'

every menu item has a sensible entry and icon attached. Even though the core operating system comes on just one CD, there's more than enough software to do regular tasks.

The Xandros File Manager is configured to work with just about all kinds of files. You can view your images, pdf and Postscript files and edit text files and documents. In fact it was hard to find any sort of file that wasn't working out of the box. Even better is the multimedia support. Every sort of audio and video file we tried launched correctly. Not just mp3 and wav files, but aac audio and DivX video, too.

Crossover Office is bundled with Xandros Desktop, and despite what the name implies, it does a lot more than support Microsoft Office. You can install a good selection of



Xandros Desktop 3 Deluxe

Windows applications which will run without any issues. Many other programs, while not officially supported, will also run fine or with very minor problems. For business users this inclusion could well be a deal breaker – if you have to run Lotus Notes or Photoshop, Crossover Office is just what you need. Furthermore, the cost of separately buying Crossover Office is half the price of the complete Xandros distribution.

The Xandros Networks utility gives access to more applications downloadable via the Internet. Each item has a full description and gives an indication of download time. Adding these applications requires just a couple of mouse clicks, and the installation goes ahead without any more effort. Xandros Networks also provides a handy panel utility to check for updates, alerting you the moment they're available.

For getting hold of Xandros Desktop you have a few options. If you don't need to run Windows software there's the standard edition, which doesn't include Crossover Office and saves you a few pounds. If you just want to run Linux at home and for personal use, there's the downloadable edition, and it doesn't cost you a penny.

Suse Linux Professional is a mature and incredibly flexible product. With two DVDs and several CDs, there's no lack of choice when it comes to applications. Suse isn't just capable as a desktop system – it has all the server options you're likely to need, and runs extremely well on laptops, supporting power-saving features and suspend modes.

Yast, Suse's centralised configuration utility, gives one place to set up your system and makes administration almost a pleasure. There are simple modules to make basic setting changes, and more complex ones to administer servers. Network services such as sharing, DNS and DHCP are all supported, and you can set up remote administration to allow a login from anywhere. The firewall is secure and simple to set up, and Yast automatically opens up the necessary ports when configuring other services.

You're spoilt for choice when it comes to applications, with up-to-date versions of all popular Linux software on the discs. With Yast it's simple to install them and make sure you have the latest bug and security fixes. With Suse's popularity, there's a lot of third-party software available for those few programs not included in the box, packaged ready to install directly.

Finally, with excellent documentation, Suse is a great way to get started with Linux. For these reasons, **Suse Linux Professional 9.2** gets the **Highly commended** award. ■



Suse Professional 9.2

The Wireless Home

Wireless



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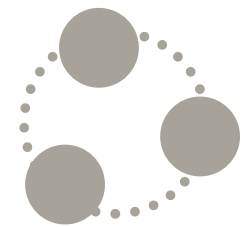


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Contents

Column

132 Alan Stevens on the Zigbee wireless standard

Reviews

135 Observer Suite 10

136 O₂ 3G Data Card
Vector Networks PC
Duo Enterprise 3

Group test

139 Gigabit Ethernet cards

Linux server boost

Linux servers accounted for nine per cent of worldwide server revenue in 2004, up by over a third compared with 2003, according to research firm IDC. There was also a 112 per cent growth in unit shipments of 64bit x86 server systems that use the AMD Opteron or Intel Xeon EM64T processors, with Opteron the dominant chip.

Broadband QoS

Tiscali is offering DSL broadband quality of service (QoS) guarantees for certain services. Queuing capabilities in the router allow things such as Voice over IP, extranet connections, teleworking, collaboration systems and voice conferencing used by remote staff and branch offices, to be given priority over other less urgent business applications such as web browsing. Companies have to make some changes to their router settings, otherwise it is managed via Cisco MPLS technology and Tiscali's traffic management tools.

Safer fast networks

Network security firm Sourcefire has launched an appliance-based intrusion-prevention system that can deal with data on very fast networks. The IS5800 can handle up to 5Gbits/sec data rates and can be used in a variety of configurations to suit many network requirements and applications, monitoring for signs of malicious activity.

Onesign tightens up system security

Biometric sign-on aims to improve authentication procedures

Single sign-on (SSO) technology provider Imprivata has begun UK and European customer trials of its SSO appliance Onesign with several UK companies, following its launch in the US last year.

The company claims the use of SSO systems reduces the work of helpdesk personnel, and is rapidly becoming best practice because it helps to ensure proper security procedures. These systems require people to use personal accounts, rather than group ones. SSO systems can also provide a centralised audit trail, showing which users have accessed specific applications.

Onesign can be configured to automatically update users' passwords or even to change the password each time a user logs in to an application.

'Companies want to implement a security policy around passwords, perhaps by



Onesign offers centralised audit trails to show what users have done

making people change passwords and making them more complicated,' said Omar Hussain, senior vice-president of marketing at Imprivata. 'But the more passwords a user has, the more likely they will forget them and raise password reset calls with the helpdesk.'

Users authenticate to the Onesign appliance using a biometric device and Onesign handles username and password authentication to individual applications, updating the password according to policy, Hussain said.

The SSO system does not require applications or client software to be modified to support authentication. The Onesign appliance uses a combination of Windows API calls and keystroke injection techniques to handle authentication dialogue boxes from applications on behalf of the user.

Currently Onesign works only with client PCs running Windows, but Imprivata is considering a Linux client for release next year.

Pricing for the Onesign appliance starts at £11,000.

Roger Howorth

AMT offers improved management

Intel has released the specification for its Active Management Technology (AMT) to improve management of networks even when systems are switched off.

The spec defines embedded interfaces in processors, chipsets, firmware and network cards so management and security software can access systems even when no operating system is available or systems are down, Intel said during its Developer Forum in San Francisco.

AMT allows remote discovery and repair of problems that would otherwise require manual intervention. PCs can be configured, software updated, asset inventories created and problems discovered and fixed.



Gelsinger: The technologies are ours

Available on the Lyndon desktop platform later this year and the Bensley server platform in 2006, AMT is designed to work with current desktop management standards. From 2006 it will use the WS-Management web services protocol as its foundation.

However, Intel's rivals such as AMD will not be invited to add

their support, potentially reducing AMT's appeal.

Intel will not make the technology available as a standard, nor will it make the spec available to competitors, insisting that its platform technologies differentiate its products. Intel will work with VMware and Microsoft to integrate its Virtualisation Technology (Vanderpool) with software virtualisation packages.

'Occasionally we work closely with AMD but the [technologies] are ours,' said Intel senior vice-president Pat Gelsinger.

Software vendors developing support for AMT include Computer Associates, Novell and Trend Micro.

Martin Veitch



networks@pcw.co.uk

Why Zigbee technology is creating a buzz

The latest wireless standard may be slower than Bluetooth, but it looks set to transform business, thinks Alan Stevens

'There's been a scramble to release Zigbee products and grand claims about how far it will reach'

A new low-power, short-range wireless technology promises a wide range of business applications.

There was an advert recently that showed how much better life would be if things such as lights and escalators only worked as long as there were people around to use them and stopped working if no-one was around. This is not as far-fetched as the advertising boys might have thought, because a new technology is well on its way to turning this particular vision into reality.

This technology goes by the unlikely name of Zigbee (apparently after the zig-zag dance employed by honey bees) and is yet another wireless standard – as if there weren't enough already. This one is designed for controlling and sensing networks, rather than more general use.

Of course, there have in the past been many attempts to use wireless technology for such systems to control utilities such as lighting, heating and ventilation systems, fire and burglar alarms, and so on, but there has never been a unified standard governing such applications. Zigbee addresses this, taking a recently ratified low-power radio specification (IEEE 802.15.4) and adding the logical network, security and application software needed to turn it into something useful.

The result has been interpreted by some as an alternative to Bluetooth or even 802.11b/g/a wireless Lans. But Zigbee is a lot slower, at just 20kbits/sec to 250kbits/sec – useless for transferring email messages and files, but more than enough to turn a light on, or for a detector to alert a control panel if a fire starts.

Zigbee is also limited in range, although the fact it doesn't require a powerful processor brings down costs and energy consumption. In fact it should allow firms to produce cheap wireless detectors where batteries last for a couple of years rather than the few hours of a Bluetooth device.

Other advantages include the ability to network thousands of nodes, or detectors, together – 65,536 to be precise. And that can be a complex mesh network with many redundant paths, hence the bee analogy. Bluetooth networks support just seven nodes in a star arrangement.

Zigbee nodes can also join the network a lot faster. A sleeping Zigbee detector can be 'woken' in under 15ms and become part of the network in just 30ms, whereas Bluetooth devices take three seconds or more to join the network.

The Zigbee Alliance, formed by firms including Honeywell, Mitsubishi, Motorola and Philips, promotes development and use of the technology, and has been busy. The first Zigbee specification was finalised by the Alliance at the end of last year. Since then, there's been a scramble to release products, as well as some expansive claims about how far the technology will ultimately reach.

Bob Heile, chairman of the Alliance, predicts millions of devices will use the technology within the first year. He also expects the technology to spread beyond simple detect-and-control networks to become part of mobile phone technology, where it will be used for everything from unlocking doors to paying for purchases.

And if he's wrong and Zigbee doesn't deliver on these promises? He'll just have to turn the lights out at the Zigbee Alliance himself.

HP takes on market leader Cisco in Wan war

HP is challenging Cisco's domination of the enterprise wide area network (Wan) router market, starting with branch office devices that HP said cost less to buy and maintain and are easier to manage than Cisco equivalents.

Many older routers are considered too slow to support current levels of inter-office Wan and web traffic, so HP believes many firms will replace such kit this year.

'Firms are looking to upgrade to faster routers which offer better performance and more security and functions,' said Wim Groeneveld, European technical consultant for HP Procurve networking.

Cisco currently has over 80 per cent of the enterprise router market and Nortel, 3Com, Siemens and Juniper/Netscreen share the remainder, according to analyst Gartner.

Aggressive pricing is necessary for any firm wanting

to challenge Cisco's dominance, and there is some belief that Cisco may have to cut prices to stop cheaper alternatives eroding its market share.

But trust in a vendor's ability to build, implement and support networking products is just as important as low cost for many buyers, said Neil Rickard, vice president at Gartner.

'Corporate buyers need confidence to know that products will work and be reliable and well supported,'

said Rickard. 'Nobody is perfect, but HP has shown it can deliver and support enterprise Lans and is a reassuring name to have.'

Rickard added that HP must quickly expand its router family to offer more scalable devices with voice ports, caching and content engines and integrated IP PBXs if it is to attract users away from Cisco.

Prices for the 7000dl series chassis start at £880.

Martin Courtney

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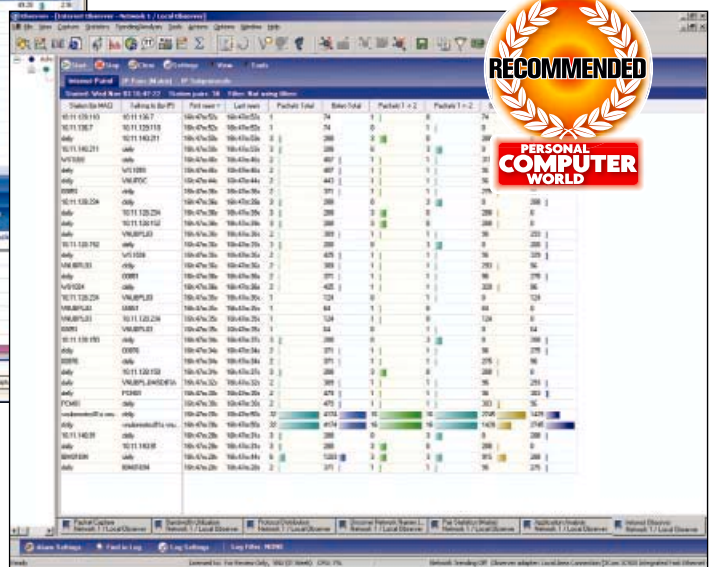
NETWORK ANALYSIS

Observer Suite 10

One of the best, and most comprehensive, packet analysers around



Left and below: The Observer Suite 10 packet analyser can monitor Lan, virtual Lan and wireless Lan performance, displaying data in real time



Observer Suite 10 is the latest version of Network Instruments' distributed network packet analyser. It features a new architecture for performing network data analysis and processing, the ability to capture and analyse packet data from virtual Lans (VLans) in real time, enhanced checks for wireless Lans, new reporting options and expanded data mining capabilities.

The product comes in several versions. The basic package costs £995, while the Expert Observer is £2,895 and the full Observer Suite 10 package comes in at £3,995. We looked at the full suite using both standard desktop and laptop PCs, all fitted with dual network interface cards. Installation proved simple enough and we were able to get things up and running, perform a packet capture and start taking data off a Lan in under five minutes – that's what we like to see.

One of the most significant changes in Observer 10 Suite is in how the Expert Probes analyse and present processed data when capturing packets at remote locations. The processing logic has been moved from the console to the actual probe so that the data is processed at the point of

capture and only screen updates are transmitted over the network.

To look at the new Vlan options we segmented our switch, creating a virtual Lan for traffic passing to and from PCW's Labs and another for network traffic running between our email servers and networked storage shares. Using the suite we could see packets received, packets transmitted, and the level of broadcasts, multicasts and overall utilisation of each Vlan – all in real time.

Network Instruments has improved the way the software monitors wireless networks, allowing admin staff to set thresholds or conditions to send alerts via email or a paging server if Wep is disabled or if a rogue access point is detected, for example. As well as security alerts, Observer 10 can also report on wireless performance parameters such as data rates and station bandwidth utilisation.

In tests we found it easy to look through uploaded packet capture files and analyse the packets individually using the connection dynamics option or just look at a summary of the whole packet capture. This gave data on the packet size distribution and a distribution

by protocols such as Appletalk, address resolution protocol (ARP) and IP. We could also drill down into the IP statistics to see how many DHCP and domain name service (DNS) packets were moving around the network.

However, not everything with the Observer suite is as it should be. We did find a problem with the pair statistics matrix, a feature designed to track pairs of stations conversing on the network. The data can be presented as a list or as a circular dial, but when using the dial, if there are a lot of stations on the Lan, then the text showing individual station's Mac or IP addresses becomes very difficult to see. Using the clumsy built-in zoom function is time consuming.

Users who need to capture and analyse large amounts data over extended periods will be pleased to know that Network Instruments has also improved the data mining capabilities of Observer 10 so that multiple files can be analysed. You can use this to search multiple

packet capture files for specific Mac addresses or IP addresses and analyse the data. The way the system reports and presents this information has also been improved. There are also more than 20 templates that can be used as a basis for making a network summary report.

Dave Bailey

DETAILS

PRICE Full £3,995 (£2,460 ex VAT)

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SPECIFICATIONS

Windows 2000 or higher • Pentium 266 PC • 256MB of Ram • 100MB Ethernet and Fibre Distributed Data Interface (FDDI) require a Pentium 400 PC • Gigabit Ethernet requires at least a Pentium III and 512MB • Wan support needs XP/Sever 2003
PROS Installation; comprehensive
CONS Clumsy zoom facility

VERDICT

A comprehensive package for network monitoring

FEATURES

ENTERPRISE VALUE ★★★★★

EASE OF USE ★★★★★

OVERALL ★★★★★

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Arriving a little late on the scene, O₂'s Data Card offers high-speed wireless Internet access for business users. The always-on service incorporates 3G communications, backed up by GPRS and Wlan connectivity.

Simply pop in your Sim and then slip the card into a notebook's spare PC card slot. Installing the Connection Manager software was simple enough and, after setting up a profile for access using 3G, we were surfing in around five minutes. The main screen offers options to access the Internet or SMS or to use the software to access Wlan hotspots provided by The Cloud and BT Openzone.

Connection Manager also gives details of 3G usage for the your session, the current uplink and downlink data transfer rates and signal strength. O₂'s software seems to be more robust than its rivals and never crashed during our tests.

We tried the 3G service from our offices in central London, Tottenham and Farnborough. With small to medium-sized files of 1MB to 72MB, average data transfer rates in central London were about 240Kbits/sec, while in Tottenham rates were slightly higher at 250Kbits/sec. Transferring larger files gave us an

average of 160kbits/sec, while downloading the 272MB XP Service Pack 2 took almost four hours. When no 3G service was available, as was the case in Farnborough, the card dropped back to GPRS, giving a data transfer rate averaging at 37Kbit/sec allowing access to email and messaging.

Where 3G coverage was available, O₂'s service performed better than those of rivals. However, coverage is not the most comprehensive at present.

Dave Bailey

DETAILS

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PROS Stability; speed
CONS Coverage; cost

VERDICT

Simpler to manage than many of its rivals, but the tariffs are high and coverage could be better

FEATURES ★★★★★
PERFORMANCE ★★★★★
ENTERPRISE VALUE ★★★★★
OVERALL ★★★★★

DESKTOP MANAGEMENT

Vector Networks PC Duo 3

Keep on top of your network



Obtain a quick inventory of your network and keep a track of what needs to be done with PC Duo Enterprise 3

Now on version 3, PC Duo Enterprise is a comprehensive

console-based PC and server management system. Small businesses will be interested in its modular approach, which allows new functions to be bought when required.

At the heart of the package is the Enterprise console, which snaps into Microsoft's own Management Console (MMC). You'll also need to install client software on each PC (node) you want to manage, although this can be generated and distributed across the network from the main console. Data gathered from each PC can be put into any ODBC compliant database.

Basic deployment is quick and you can obtain an inventory of your network in a short space of time. Version 3 includes a new HTML-based user interface for inventory management, which proved to be an improvement. Nodes can be grouped according to specification and the new compare function should be a valuable tool to aid diagnostics.

The Diagnostics module itself automatically protects desktop applications by taking snapshots that can restore a system when needed, while the Remote Control module lets you control any client or server via a network

or the Internet. The latest version now includes support for Linux and Pocket PC.

The Helpdesk module, used to manage and track supported calls, has also been tweaked. All of its components can now be installed on a web server and work has been carried out to improve performance.

This is an easy to follow package that will enable administrators to keep on top of networks, while its modular approach will keep costs down.

Alex Arias

DETAILS

PRICE From £168 for 10 nodes - single module

CONTACT Vector Networks 01827 673 33

www.vector-networks.com

SPECIFICATIONS

Windows 98/ME/NT4/2000/XP • 60MB free disk space • ODBC compliant database • Helpdesk module
PROS Ease of use; reporting facilities; modular
CONS Limited support for anything other than Windows
VERDICT
Comprehensive management suite well suited to small businesses

FEATURES ★★★★★
PERFORMANCE ★★★★★
ENTERPRISE VALUE ★★★★★
OVERALL ★★★★★

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Allows you to connect wirelessly to the internet and other computers in your home or office**

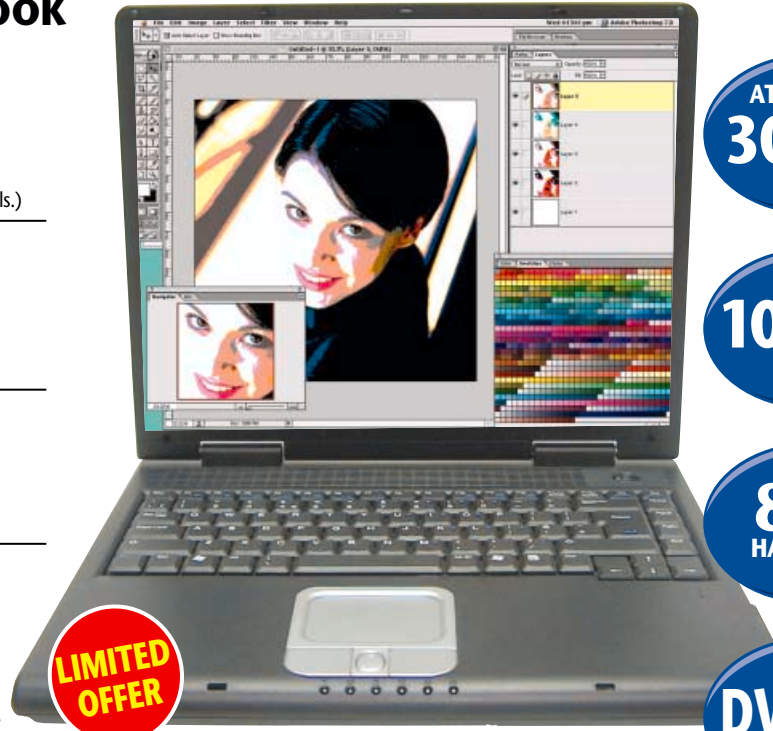
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WORDS: MARTIN COURTNEY

Play your fast cards right

Gigabit Ethernet cards can help improve the speed of data throughput and cut down on bottlenecks on a business network. Here are five to choose from

Gigabit Ethernet network connectivity components are now installed as standard on almost every new server and office workstation. However, many organisations may need to upgrade the 10/100Mbps/sec Fast Ethernet cards and interfaces on legacy systems to eliminate bottlenecks and improve network performance.

The one certainty facing any local area network (Lan) administrator is that, sooner or later, the volume of data traffic travelling over the infrastructure will grow, as more users, applications or storage devices are added.

Many organisations are currently trying to reduce communications and operational costs by moving to converged voice and data networks, for example. This presents administrators with two challenges: to find more

bandwidth to carry extra voice traffic and to ensure that voice calls are given priority over data transmissions.

We've reviewed and tested five cards in this group test, all of which comply with the Institute of Electronics and Electrical Engineers (IEEE) 802.1p prioritisation standard, essential for IP telephony and Voice over IP (VoIP) implementations. This ensures that IP-based voice conversations can be given transmission priority over data packets so they do not suffer from problems such as latency and jitter, which can severely reduce audio quality.

Support for the 802.3x flow control standard is also important. This helps reduce network congestion by protecting full-duplex ports from the packet loss that often occurs when multiple data streams are forwarded to the same port, thereby exceeding its capacity.



Cabling requirements

Autosensing 10/100/1000BaseT NICs can be used with all types of Ethernet cable from Cat 3 upwards, but the higher 1Gbit/sec bandwidth is only available on Cat 5 wiring that conforms to the TIA-568 standard. This spec uses four pairs of copper wires, as opposed to two, and features a higher standard of shielding material to prevent attenuation or signal loss. Many organisations will already have the necessary standard of cabling installed in their premises. But anyone looking to boost Lan bandwidth by upgrading to 1Gbit/sec components should first analyse the wiring using a handheld cable tester to make sure it is capable of supporting the higher bandwidth, otherwise a costly additional upgrade may be needed.

Allowing jumbo frame sizes can reduce congestion by squeezing more data into a single packet, reducing the amount of processing needed to handle the data stream. The IEEE's 1000BaseT Gigabit Ethernet standard allows up to 9KB to be included in a single frame, up from the 1.5KB limit specified by 10/100 Fast Ethernet. All the cards here support this feature to a certain degree.

Another important capability is compliance with the IEEE 802.1Q virtual Lan (VLAN) standard, which defines the operation of VLAN bridges on the network. These allow larger networks to be split into smaller subnets to prevent broadcast and multicast traffic taking up more bandwidth than is necessary and, in so doing, add an extra level of network security.

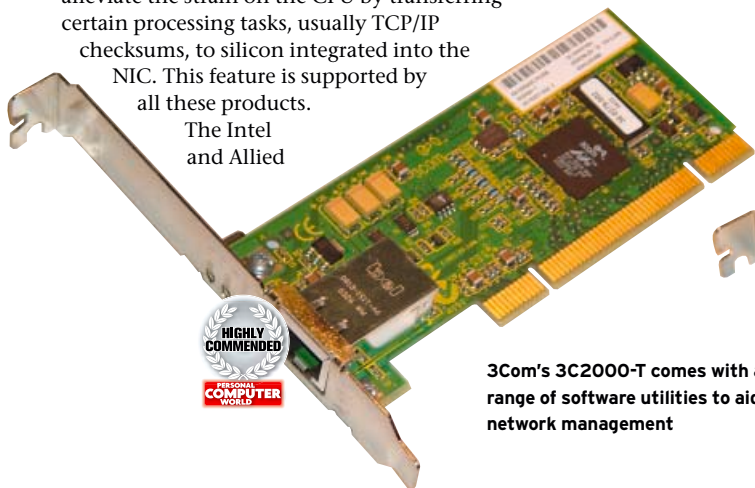
Only one of the cards reviewed here, the Intel Pro/1000MT server adapter, supports the PCI-Extended (PCI-X) bus, which increases the bus speed of a standard PCI 2.2-compliant network interface card (NIC) and motherboard to 133MHz. This boosts the maximum data exchange rate between the system processor and the NIC to 1.06Gbits/sec from 532Mbits/sec.

PCI-X is also backwards-compatible, with the result that PCI-X cards can be installed in a standard PCI slot, though their clock speed and throughput will be decreased. Both PCI and PCI-X cards can be used on the same bus, though the bus speed will run at the speed of the slowest card. PCI-X is more fault tolerant than PCI, as it is able to reinitialise a faulty card or take it offline before computer failure occurs, for example.

Two of the other cards, Allied Telesyn's AT 2971-T and D-Link's DGE 550T support both 32bit and 64bit PCI buses at 33/66MHz clock speeds. The remaining two, 3Com's 3C2000-T and Netgear's GA311, both supported only 32bit at dual 33/66MHz clock speeds, but nevertheless achieved the fastest peak throughput in our tests.

Another performance boost comes from the ability to alleviate the strain on the CPU by transferring certain processing tasks, usually TCP/IP checksums, to silicon integrated into the NIC. This feature is supported by all these products.

The Intel and Allied



3Com's 3C2000-T comes with a range of software utilities to aid network management



Allied Telesyn's AT-2971-T's advanced resilience and failover functions make it ideal for use in mission-critical servers, but this is reflected in the high price

Telesyn cards also support 802.3ad link aggregation. This improves network performance further by load sharing and trunking multiple cards together for more bandwidth. It also increases resilience by pairing cards, with one providing fault tolerance for the other.

Depending on the number of nodes on the network, integrated management capabilities can be a real bonus for network administrators. The D-Link DGE 550T and the Netgear GA311 came with nothing more than the driver. But the other three were shipped with a varied array of software utilities designed to make the network manager's job easier, including diagnostic and remote installation software.

Remote administration is also made less onerous by support for Wake-on-Lan (WoL) or the Wired for Management (WfM) 2.0 specification, again found only in the more advanced cards. WfM 2 consists of five key components, including Preboot Execution Environment (PXE), Remote Wake-up, Advanced Configuration and Power Interface (ACPI) power management, as well as problem resolution and instrumentation.

Intel Pro/1000MT

Intel makes a range of copper and fibre-based NICs, this one being the server version of the 1000Base-T Pro/1000MT, which also comes as a desktop adapter. Like some of the other cards tested here, it comes with both 32bit and 64bit bus support, but uniquely features PCI-X capabilities as well. The Pro/1000MT also comes with a half-height bracket so the card can be installed in smaller cases, though the full-height component is attached as standard.

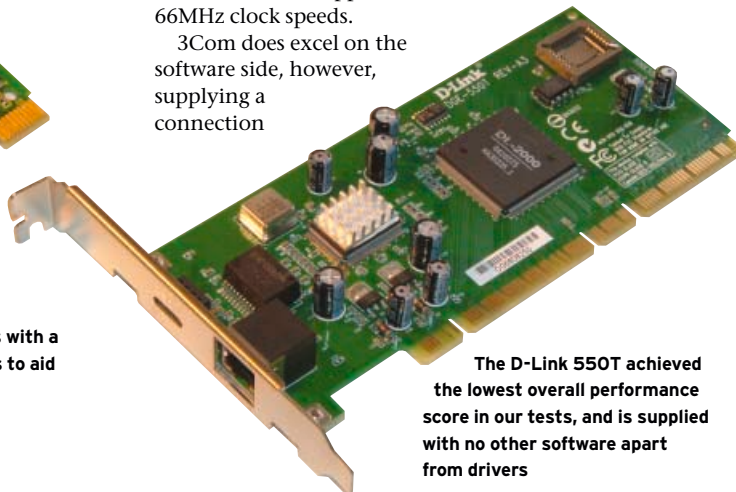
Though not the fastest card we tested, the Pro/1000MT was the most consistent performer with a differential of only 12Mbits/sec between the slowest and fastest achieved rates in our tests. It also supports a range of advanced teaming features designed to increase network resilience and fault tolerance by forwarding network traffic to another Pro/1000MT on the Lan card should the first one fail, and by providing load-balancing features.

The Intel Proset II software offers configuration and management features, including one which allows administrators to create an installation CD to help roll out multiple Pro/1000MT cards to a large number of PCs.

3Com 3C2000-T

3Com's 3C2000-T is a half-height card that looks as though it should come with an extra bracket to allow it to fit inside smaller cases, but does not. Its biggest drawback for some administrators might be the lack of 64bit support: the version we tested came in only a 32bit bus version that supports 33MHz and 66MHz clock speeds.

3Com does excel on the software side, however, supplying a connection



The D-Link 550T achieved the lowest overall performance score in our tests, and is supplied with no other software apart from drivers

assistant, virtual cable tester and managed boot agent alongside the driver, user guide and diagnostic software. There is also the option of creating a set of installation disks to help roll out multiple NICs to a large number of desktops.

Performance was consistently good, bettered only by the Netgear GA311, but the 3C2000-T seemed to be a much more stable card. The ability to offload TCP, UDP and IP checksums from the CPU and onto the card helped it to achieve its impressive throughput. This was also one of the cheapest cards we looked at.

D-Link 550T

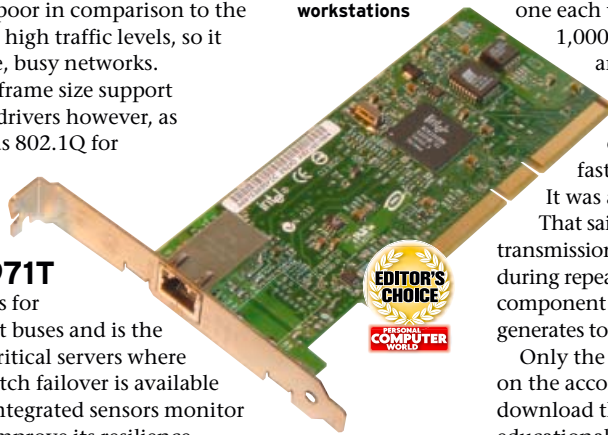
D-Link's 550T supports the 64bit bus and comes with both half-height and full-height brackets so it can be installed in a variety of system cases. No software utilities other than the driver are provided, but both the manual and installation guide come in paper and electronic versions.

This card's performance was poor in comparison to the others, particularly at sustained high traffic levels, so it may not be ideal for use in large, busy networks.

The card does feature jumbo frame size support to 8KB within NDIS and Linux drivers however, as well as standard facilities such as 802.1Q for multiple VLAN and 802.3x flow control, but not 802.1p for packet prioritisation.

Allied Telesyn AT-2971T

The AT-2971T card scores points for supporting both 32bit and 64bit buses and is the best choice for use in mission-critical servers where resilience is key. Redundant switch failover is available and, according to the vendor, integrated sensors monitor the NIC's health and status to improve its resilience, though we were unable to test this particular function. A neat utility called virtual cable tester helps



Intel's Pro/1000MT was the only card in the group test to support the PCI-X bus now found in some new servers and high-end workstations



administrators detect and report on cabling problems though, and a remote boot (PXE 2.0) upgrade can be added to the existing WoL capability.

The driver, the latest version of which needs to be downloaded from the Internet, supports a number of advanced settings including jumbo frame sizes, but no other management software was provided, besides a pdf manual.

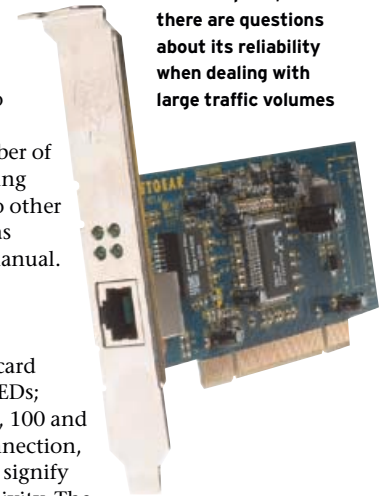
Netgear GA311

This is a half-height, three quarter length PCI card with a total of four link LEDs; one each to indicate 10, 100 and 1,000Mbps/sec connection, and another to signify network activity. The

GA311 was a consistent performer with a differential of only 18Mbps/sec between the fastest and slowest performance score recorded.

It was also the fastest card we tested. That said, it was the only card to suffer from transmission breaks that hung both the card and the test PCs during repeated testing. This may have indicated a faulty component but may also suggest that the onboard processor generates too much heat during heavy traffic loads.

Only the installation guide and the manual are included on the accompanying CD, and we had to go online to download the latest software driver. The CD also contains educational software and an installation tutorial to help those unfamiliar with Lans and networking to get their system up and running.



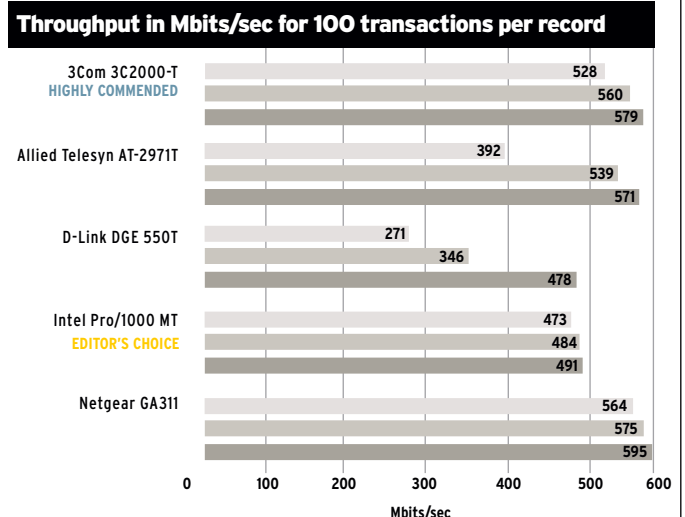
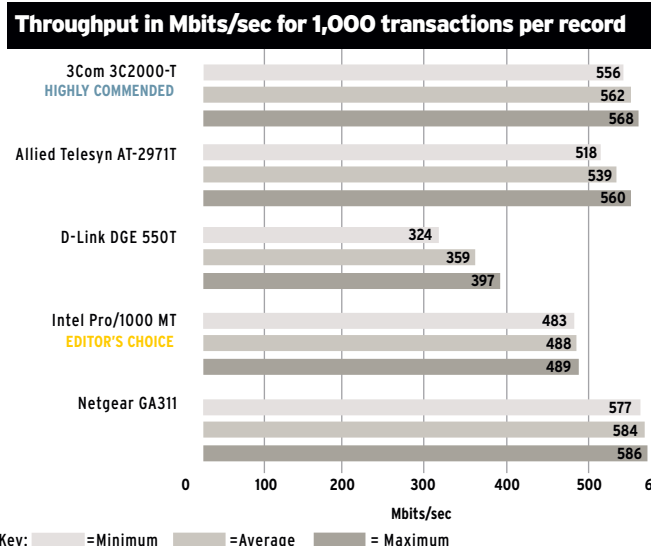
Netgear's GA311: the fastest throughput for a low price, but there are questions about its reliability when dealing with large traffic volumes

How we tested

We used NetIQ Chariot 5 to test throughput between two configured end points. Each end point consisted of an identical Gigabit Ethernet card, with full-duplex mode enabled, installed in an Athlon 2.1GHz workstation with a PCI 2.2-compliant motherboard and 256MB of Ram running Windows 2000 Pro. The end points were connected by two 3m lengths of Cat 5e TIA-568 Ethernet cable via an eight-port 1000BaseT Gigabit Ethernet switch, the HP 2708, to which no other network nodes were

attached. We made no alterations to the default configuration values of any of the cards and left the motherboard jumper settings to auto-sense the card's bus speed.

Within Chariot, we increased the size of each IP data packet from the default 1,000bytes to 10,000bytes to simulate heavy network traffic loads, and tested on three record sizes - 100, 500 and 1,000 transactions per record - with 100 records transmitted each time. Below are graphs showing the average of the three minimum, average and maximum throughput results.



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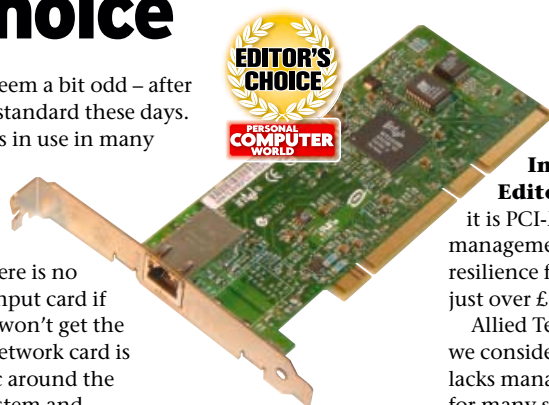
Table of features



MANUFACTURER	3COM	ALLIED TELESYN	D-LINK	INTEL	NETGEAR
MODEL	3C2000-T	AT-2971T	DGE-550T	PRO/1000 MT SERVER	GA 311
Price inc VAT (ex VAT)	£30.55 (€26 ex VAT)	£509.95 (€434)	£78.73 (€67)	£105.75 (€90)	£30.55 (€26)
Telephone	01442 438 000	01256 707 070	020 8731 5555	0870 112 0912	0870 129 3010
Chipset	Unspecified	Marvell 88E8010	DL-2000	Intel 82545EM	RTL8169S-32
64bit bus support	X	✓	✓	✓	X
PCI-X support	X	X	X	✓	X
Ports	Single RJ45	Single RJ45	Single RJ45	Single RJ45	Single RJ45
No of LEDs/ function	4/1000, 100, 10, Link	4/10, 100, 1000, Activity	4/Link, Activity, 1000, 100	2/Link, Activity, ID, Speed	4/1000, 100, 10, Data
Bracket options	1 full height	1 full height (optional low profile)	1 full height, 1 half height	1 full height, 1 half height	1 full height
Dimensions (mm)	120 x 50	127 x 121	140 x 60	165 x 121	140 x 121
Jumbo frames	✓	9KB	8KB (NDIS & Linux)	✓	✓
TCP checksum offload	✓	✓	✓	✓	✓
Buffer	128KB	Unspecified	Unspecified	64KB	Unspecified
802.3x flow control	✓	✓	✓	✓	✓
802.1q VLAN tagging	X	✓	✓	✓	✓
802.1p Priority queuing	✓	✓	✓	✓	✓
802.3ad Link aggregation	X	✓	X	✓	X
ACPI 2.0	✓	✓	X	✓	X
Remote management	WFM 2.0; PXE 2.1	WoL; PXE 2.0	X	X	X
OS support	Windows 2000/XP/ME/98/NT4; Novell Netware 5.x/6; Linux 2.4	Windows 2000/XP/Server 2003; Netware 4.2+/5/6; Solaris 7/8/9; Linux kernel 2.4X; IBM AIX 4.3.3+/5.1	Windows NT4/2000/98/95/ME/XP; Netware 5.1; Linux kernel 2.4+	Windows 2000/NT4/XP; Novell Netware 4.2/4.11/5.0/5.1/6; Sunsoft Solaris 7/8; Linux 2.2.5 or later; Unixware 7.x; FreeBSD	Windows 2000/ME/98/NT4/XP; NDIS 2.0
Software	3Com managed PC Boot Agent & Connection Assistant	Cable monitoring and auto correct	None	Intel Proset II	Networking education software
PRODUCT OVERVIEW					
Pros	Fast throughput; value; management software	Excellent resilience features, good performance	Reasonably priced	PCI-X support; value; good management features	Low cost; high peak performance
Cons	Lacks 64bit support	High price; no management tools	Performance; lack of management software; limited driver and support	Average performance	Potential reliability issues; no management software
Overall	Good performance at a bargain price. Range of management features should appeal to many	Advanced failover and resilience make this stand out, but its high price may deter some	Sluggish throughput suitable for networks with low traffic, where price is the main concern	Management features, PCI-X support, consistent if average performance, means this is a solid choice	Value for money and capable of very good performance, but reliability may be an issue
SCORES					
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

Editor's Choice

Testing Gigabit Ethernet cards may seem a bit odd – after all, PCs come with network cards as standard these days. But there are still many older systems in use in many companies and, with increasing demands placed upon both employees and the networks that serve them, an ageing, slow card will be a frustrating bottleneck. While there is no point in upgrading to a high-throughput card if you have a slow switch, equally you won't get the full benefits of a fast switch if your network card is slow, as it will struggle to push traffic around the network, slowing down the user's system and impacting their workload. Any company with centralised systems that demand regular, large updates from individual user's PCs will need a decent



Intel Pro/1000MT

network card capable of ensuring the data flow is as fast and smooth as possible.

Though not the fastest card we looked at, **Intel's Pro/1000MT** server adapter won our **Editor's Choice** award. Unlike the other cards, it is PCI-X compatible and comes with a range of management utilities and advanced performance and resilience features – all for the very reasonable price of just over £100.

Allied Telesyn's AT2971-T was a well-specified card and we considered it for the Highly Commended award. But it lacks management software and could be too expensive for many small to medium-sized businesses. Instead we felt **3Com's 3C2000-T** was a stronger choice for our **Highly Commended** accolade. It was fast, a consistent performer as well as excellent value for money.

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EDITED BY NIGEL WHITFIELD

Contents

148 Question time

Hints and tips for solving your technical queries from our Hands on experts

152 Hardware

How to tweak Media Center so it does just what you want

154 Overclocking

Find out how far a Pentium III can be pushed

156 Windows

Using the boot.ini file to customise your boot up options

158 Linux/Unix

How to handle removable storage devices using Gnome and KDE

162 Digital imaging & video

Protect the copyright of your online images by using a watermark

164 Word processing

Discover the new Word Viewer, and search your hard drive with MSN Deskbar

181 Spreadsheets

Add VAT to cells using one of several shortcuts revealed this month

183 Sound

Get the most from Windows Media Player with some useful tips and tweaks

185 Networks

The ins and outs of IP addresses and how they are assigned

189 Databases

More advice on moving data from one database to another

195 Visual programming

How to deal with user permissions and get Windows XP themes in Visual Basic 6

197 Windows secrets

Discover the many hidden functions of Windows XP

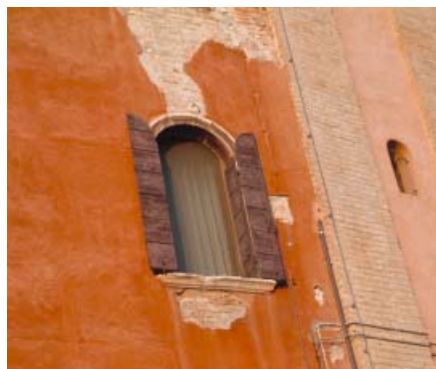
203 Windows Raid 5

How to make Windows XP fit for Raid 5 with just a few simple tweaks



PAGE 148

Turn to Question time to find out if you can use a wireless network link on your Media Center PC



PAGE 162

This month's Digital imaging & video looks at how to protect your online images



PAGE 185

Find out how IP addresses are assigned in this month's Networks column

We have a wealth of tips and tricks for you in this month's Hands on section. If you've ever felt that reaching some parts of Windows just needed too many mouse clicks or didn't give you the information you want, look at Windows secrets, where you'll find details of the command-line tools that you can use to make your life easier and help sort out problems.



We've more secrets of Windows in the second of this month's features, where we show how to enable Raid 5 in software on Windows XP, completely free.

In Hardware, Gordon Laing provides a look at some of the tweaks, fixes and hacks that you can apply to Windows Media Center to make it do exactly what you want, while in Overclocking you can find out just how far you can push an old Pentium III system.

If you're interested in trying out other operating systems or simply re-installing, you'll find helpful tips on using the boot.ini file in Tim Nott's Windows column, where he also provides some help for Acrobat users. And if Linux is one of the systems that you'll be using on your computer, Barry Shilliday explains how that operating system deals with hotpluggable hardware.

One of the more irksome things about publishing on the Internet is that some people assume they can just take your work and use it as they wish. One way of protecting your images is by using watermarks, and in the Digital imaging column, Ken McMahon explains how this can be done.

In Spreadsheets, Stephen Wells looks at useful functions for people who have to deal with VAT, while in Word processing we look at the new Word Viewer and test MSN's solution to hunting through all the documents on your hard drive. We also have some tips to help you get the most from Windows Media Player, courtesy of Niall Magennis in Sound.

In Networks, Alan Stevens explains how IP addresses are assigned and the implications of Network Address Translation, while programmers can find out about support for themes in Visual Basic and how to deal with user permissions under Windows XP, in Tim Anderson's Visual programming column. Finally, we have the usual four pages of solutions in Question time, and in Databases Mark Whitehorn continues his look at moving data from one system to another.

Nigel Whitfield



Advice from our experts

Our Hands on experts answer your questions and solve your problems

Hardware

Q I currently use BT Openzone for Wifi access at hotspots around the UK and wondered how easily I could use hotspots in the US? Will my equipment work and are there any roaming agreements with Openzone in the US?

Steve

A First things first: your equipment should work fine in the US. The 802.11x wireless networking standards are global, so despite some regions having regulatory issues with certain frequencies or channels, it's safe to say a Wifi device from one country will happily connect to a Wifi network in another. Technically speaking, all commercial hotspots employ the 802.11b wireless standard, which is supported by adapters using 802.11b or 802.11g.

As for Internet access, BT Openzone has roaming agreements with many international hotspot providers, allowing you to key in your log-in details and connect. The biggest hotspot partner in the US is T-Mobile, which offers access from numerous locations. Roaming is available to any BT Openzone account which is billed monthly – just call 0870 240 5745 before you go to register. Roaming usage with Openzone is, however, excluded from your monthly minute allowance and is charged separately – for T-Mobile hotspots in the US, this is 6p per minute.

Just because you use BT Openzone in the UK though, doesn't mean you have to roam with that company abroad. You can sign up with any local provider or buy pre-pay cards. T-Mobile hotspots charge \$6 (£3.15 approx) for an hour pre-pay card, which coincidentally also works out at about 6p per minute. If you're only connected for a few minutes, the per-minute billing offered by the Openzone roaming agreement could work out cheaper. Visit www.btopenzone.com/find/going_abroad.jsp for more information.

Q I enjoyed the articles about installing Windows XP Media Center Edition 2005 on your own PC. I'd like to build a standalone system and I wondered if a wireless link for the net connection would be OK.

David Bennett



Media Center needs a network connection for the EPG – but wireless is still faster than your broadband, so it won't cause a bottleneck

A Windows XP Media Center Edition briefly connects to the Internet every night to download the updated electronic programming guide. It also connects when you browse the Online Spotlight section, which features content including Internet radio stations. Like other versions of Windows, it will also use the Internet to retrieve artist and title information on audio tracks.

Since even the slowest 802.11b Wifi link can shift data quicker than the fastest current broadband speeds, a wireless Internet link will not be a bottleneck for Media Center PCs when accessing the Internet.

Where you'll benefit from faster networking is when streaming recorded video from your Media Center PC to other devices in your home. 802.11b Wifi still has enough speed to stream DVD-quality video to a single device but, realistically speaking, if this concept appeals you should employ either 802.11g or 802.11a wireless hardware. To prove this point, the Media Center Extender devices recently launched in the US employ both 802.11g and 802.11a wireless links.

Linux

Q I use KDE and would like to share some files over the Internet. What software is available for this?

Mark Treen

A If you want your friends just to receive files, you're already set. There's an applet included with KDE called 'Public File Server', which does exactly this. It lets you share any directory and includes a bandwidth

limit on download rates. Since it's a panel applet it can be run only from there – right-click on the panel and select Add > Applet > Public File Server. Now right-click on the new panel icon, select 'New Server' and choose a directory to share. Any files here are available to anybody, they just enter the URL and port into their web browser. There's a tool to monitor activity too, plus a menu to pause, stop and start the server. You can share any number of directories – each one has a separate port number and download limit.

Q When I place my pointer over certain parts of the screen, it usually flickers, especially if anything is changing underneath it. Is there any way to fix it?

Steve Reynolds

A This is a problem with hardware cursors. Most graphics cards have hardware support for rendering the mouse cursor and if there's a problem with that or your drivers you often end up with a flickering pointer. The system can use both software and hardware cursors. It's worth trying to force both.

Edit the /etc/X11/xorg.conf file (or if this doesn't exist, use /etc/X11/XF86Conf) and search for the Device section. Now add here:

```
Option "HWCursor" 0
```

Log out, and restart the X server with Ctrl & Alt & Backspace (not Delete). If this hasn't fixed the problem change the 0 to 1 in order to force hardware cursors on.

Q I want to get my friends on the Internet to see my Linux system. How do I take screenshots of the desktop and individual windows?

Juliette Ledsham

A It depends on the desktop you're using. For Gnome, press the Prt Scr button (found above the cursor keys) and an applet will pop up to save the current screen. To capture a window instead, click in the window you want and press Alt & Prt Scr. In KDE, you need to load the Screen Capture Program, which you can find under Graphics > More Applications. This tool lets you capture a specific region of the screen too, as well as using a delay before taking the shot (see screenshot 1).

Digital imaging

Q I save details about my digital images in either a spreadsheet or a text file. The spreadsheet has the advantage that it is easily searchable. The danger is that these files will become separated from the images. The jpegs save extra Exif information, so at least in future you know when the photo was taken, as well as other basic information about the camera. By right-clicking and selecting properties in Windows Explorer, I can edit some fields and Windows Explorer can also display these, by right-clicking on the toolbar and adding these columns. This can then be used for sorting, but entering information this way is very difficult. Is there any simple software that lets you easily manage the Exif data in your jpeg images?

Andy Scott

A Yes, there are lots of commercially available and shareware applications that will let you organise your digital photo collection and view and edit Exif data. If all you want to do is display and edit Exif data, try a shareware utility like Irfanview. Applications like Adobe Photoshop Elements 3, Adobe Photoshop Album 2 or Jasc Paint Shop Photo Album 5 are easy to use and will help you organise your digital photo collection and retrieve images on the basis of date, keyword searches and a range of other criteria (see screenshot 2). For heavy-duty digital asset management tools, such as those used by stock photo libraries, check out Extensis Portfolio 7 and Canto Cumulus 6.5.

Spreadsheets

Q Our accounts department at work only has to enter a single-letter code and their spreadsheet allocates expenses to the right account. How could I do the same thing at home using Excel?

Suzanne Baron

A You could do this with just one formula if you lay out your expense sheet as in screenshot 3. The dates of entry are in column A, whom you paid in B, the cheque numbers (or blank for cash) in C, the codes in D and the amounts in column E.

Let's say these are car expenses. Put the headings Petrol, Maintenance, Insurance and Storage in cells F3 to I3. In the row above, enter their initial letters for codes: P in F2, M in G2, I in H2 and S in I2. In cell F4 enter =IF(\$D4=F\$2,\$E4,0) then Copy it, highlight the range, F4:I8 and Paste.

Q How can I bring forward my current account balance, which is always in the last cell in column G of my Bank worksheet, to a cell on another sheet in the workbook?

Paul Clifton

A You can create a simple function that will do this and keep the cell up to date. Press Alt & F11 to open the VBA editor. Choose Insert Module and type in:

```
Function Balance()  
    Balance =  
Worksheets("Bank").Range  
("G1").End(xlDown)  
End Function
```

(Key: ✓ code string continues)

(see screenshot 4). Close the VBA editor and Save the file. Choose the cell on the worksheet where you want the account balance, then Function on the Insert menu, User Defined category and select Balance. Choose OK twice. Your latest bank balance will be displayed. After further entries have been made on the Bank sheet you can refresh the other cell by choosing it and pressing F2 and Enter.

Q I do my accounts using Excel. I have four workbooks (one per quarter), each with 13 sheets (one per week). Cell F2, in each sheet, has the week-beginning date in it. Is it possible to put the start date into the first sheet of each workbook and then make it carry forward through the rest of the worksheets?

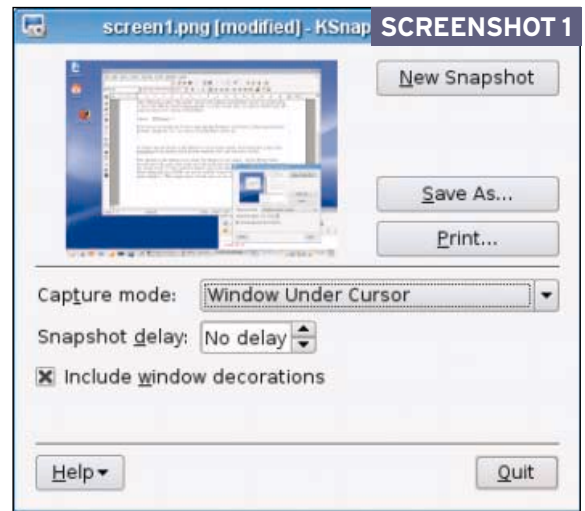
Pat Philbrick

A If cell F2, Sheet 1 has the date 30/5/05, enter in cell F2 on Sheet 2:

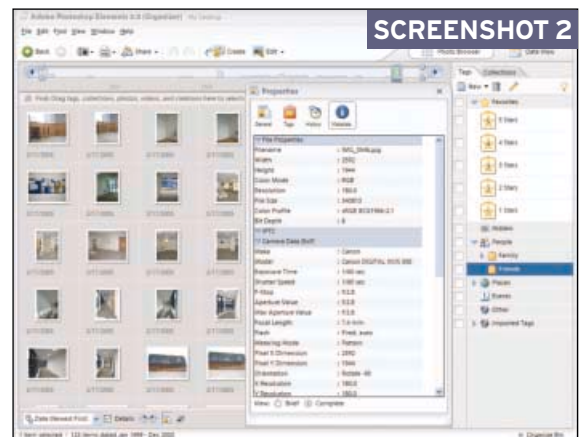
```
=DATE(YEAR(Sheet1!F2),  
MONTH(Sheet1!F2),DAY  
(Sheet1!F2)+7)
```

and you'll display 6/6/05. Each succeeding sheet would have a similar formula, but adding seven days to the preceding sheet. With accounts workbooks like yours it usually saves time if you save a copy of the complete workbook with all its entries at the end of the period and then remove the entries in the copy, but keep the formulas.

To do this, group all the worksheets. Select a worksheet by clicking the Select All button (the square at the left of the column letters and the top of the row numbers). On the Edit menu, click Go To. Click Special. Click Constants and Numbers. Press Delete (see screenshot 5). Save this new worksheet as a template that contains only formulas. Then you only have to enter one start date.



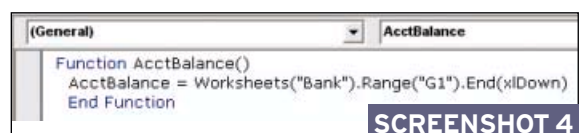
Capturing screens with Linux is easy – on KDE there's a special application to do the job



You can organise and search through Exif data with programs like Adobe Elements

	A	B	C	D	E	F	G	H	I	J
	Date	Paid to	Cheque No	Code	Amount	P	M	I	S	
4	11/6/05	Billy's Garage	2045	M	E 95.00	E	95.00	E	E	E
5	12/6/05	Shell	2046	P	E 40.00	E	E	E	E	E
5	13/6/05	Brown's Agency	2047	I	E 350.00	E	E	E	350.00	E
7	14/6/05	Car Wash		M	E 2.50	E	E	E	2.50	E
8	15/6/05	A1 Car Parks	2048	S	E 125.00	E	E	E	E	125.00

How Excel can fill in entries automatically



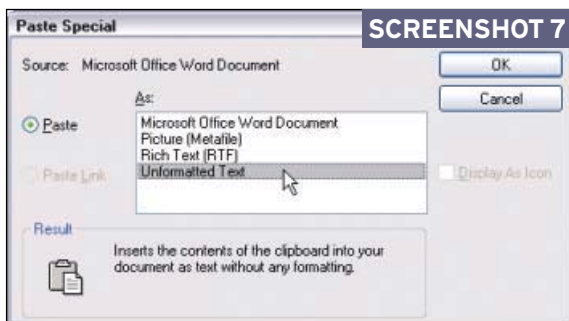
Bringing forward a bank balance in Excel



Deleting entries in an Excel workbook prior to creating a template



You can only start the Picture and Fax viewer from an image file



Pasting plain text in Wordpad to strip out any HTML

Q I'm trying to create an Excel spreadsheet to generate quotes. Of 100 possible items, typically only about 10 are needed on the customer copy. I prepared a worksheet with the items listed and use LOOKUP to calculate discounts based on total order value. But I want to print a copy showing only the items that have a number greater than zero in the quantity column.

Robin Sanders

A On the Data menu choose Filter, AutoFilter, Custom and then 'is greater than' and enter 0. This temporarily hides all the redundant rows. Print the sheet, then re-display all rows by choosing Show All on the AutoFilter menu.

Q I'm using Excel 2002. How can I calculate 5.405204129 raised to the power 3.14?

Niamh Walsh

A You can either use the operator ^ (the carat mark above the 6 on the top row of the standard keyboard) as in:
`=5.405204129^3.14`
or use the POWER function as in:
`=POWER(5.405204129,3.14)`
Either way the answer is virtually 200.

Windows

Q When I have messed up a hard drive in the past, I've taken it to a local shop for 'low-level' formatting. I would love to be able to do that for myself and wonder if you know of any software?

Terry Cullen

A The term 'low-level formatting' strictly speaking applies only to the manufacturing process. Many manufacturers provide utilities to 'Zero Fill' a disk, removing all data. You can try the support and downloads section of the manufacturer's website or there is a useful list of links at www.ariolic.com/activesmart/low-level-format.html.

Q When inserting a picture CD, in XP Home, Autoplay gives the option of 'View Slideshow using Windows Picture & Fax Viewer' and this works perfectly. But how can this be used without having to remove the CD and reinserting it? I assume there is an .exe file hidden somewhere?

Mike Craig

A The Viewer is not a .exe, it's a .dll and can't be run as a program. You'll find, however, that on a standard system it's the default action for most picture types, so will

load if you double-click on one. If you have other imaging software installed then you may need to right-click, 'Open with' to find the viewer (see screenshot 6).

Word processing

Q I have always found the utilities/freeware and programs on PCW's CD very helpful and save them for 12 months after issue. I would like to compile an index of what there is on each CD, but have difficulty 'lifting' the lists from the CDs and pasting them into a word processor for printing. Usually, the lists result in a large font with double or greater spacing. Can you advise a better way to achieve this?

Neal Baldwick

A You don't tell us which word processor you are using, but the answer is most likely the same for all. Instead of doing a simple paste, go to Edit, Paste Special and choose the option for 'Unformatted Text' - this will strip out the HTML and other formatting, leaving you with just the text, which you can then format to your own wishes (see screenshot 7).

Q In Word 2003's 'Set Language' list there is a huge range of languages available from Afrikaans to Zulu. However, if I mark selected text as German it doesn't check the spelling or grammar. Is there a way of enabling German proofing and getting rid of the languages I don't need?

Stan Bell

A The presence of a language on the list does not mean that the proofing tools are available. Those that are installed will be marked with a tick. In the standard versions of Office, only English, Spanish and French proofing tools are supplied. If you mark text as German, for example, then all that will happen is that it won't be checked by the proofing tools of any other language. We don't know of a way of removing unwanted entries from the list, but there are supplemental proofing CDs available for both Office 2003 and XP, which add support for around 50 languages. At the time of writing, the 2003 version was available for around £60 inc VAT from www.amazon.co.uk.

Q I want to use hyperlinks in Word to go from an index file to a directory, rather than a specific file. Is this possible?

Roger Terry

A This is possible in Word 2003 - you just select the folder in the



hyperlink browser then click OK, rather than double-clicking on it to expand. In Word 2000 you need to be crafty – select a file within the folder, then edit out the file name in the 'File or web page name' box. You can't do this in earlier versions, but there is a work-around. Create a macro containing this code:

```
Sub Openfolder()
Dim Myfol
Myfol=Shell("Explorer.exe
folderpath",
vbNormalFocus)
End Sub
```

Replace folderpath to suit and the macro will open the chosen folder in Explorer – exactly as a hyperlink would. To get this to work from a document, insert a MACROBUTTON field. This has the form MACROBUTTON macroname displaytext. The last item is the text that appears in the document and you can format it in a linkish way.

Databases

Q I was interested in an item in your November 2004 column about Access using SQL Server as its database engine. From which version does Access have this facility?

Ian Williams

A This feature (project files) was introduced in Access 2000. Prior to that it was difficult to move data from a back-end database like SQL Server into Access. From Access 2000 onwards, it became possible to work in Access and store the data in SQL Server. This represented a huge advance because, for the first time, Access could make use of a database engine that supported transaction control, logging and other features lacking in the Jet database engine.

Internet

Q I have built a website and incorporated several email links. All the email links are for the same email address, but for different subjects. On other websites I have visited, when you click on an email link the subject field is filled with the relevant subject. I would like to be able to do this on my site in order to filter different email subjects into different folders.

Philip Charlton

A The way many email programs work is that you can specify a subject as a parameter in the mailto tag. It looks a little like this:

```
<a href="mailto:webdev@
pcw.co.uk?subject=
I love your column"
>click here</a>
```

However you should bear in mind that some mail programs won't pay attention to the subject you specify, so there will be some messages you'll need to sort manually. And, of course, there's nothing to stop people from changing the subject of the message.

One alternative is to use address extensions, which is where you can append a plus symbol to your address, followed by extra text. It's ignored for delivering mail to your mailbox, but you can use a filter in your email program. So, you'd use addresses like webdev+feedback@pcw.co.uk and webdev+question@pcw.co.uk; this should work with any email program, if supported by your ISP.

You should also bear in mind that by using a mailto: link, you're exposing your email address on the Internet and will eventually end up receiving spam, if you don't already. For that reason, many sites prefer to provide a form for people to fill in, with a selection of subjects as a dropdown menu (see screenshot 8). We'd recommend that – but check that the form is secure as some form-to-email scripts can be abused by spammers to send messages that appear to be from your server.

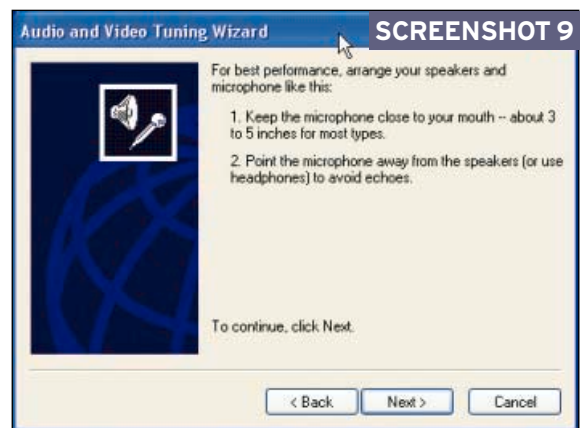
Q I am trying to set up a webcam/videoconferencing facility with my son in New Zealand. We both have Logitech Quickcam Pro 4000 cameras and are using MSN Messenger. My son has Windows XP on a Sony laptop and is using broadband. I have Windows ME and am using a dial-up system. The picture we receive is good, although it changes every 20 seconds, but the sound is either intermittent or non-existent. Is the equipment compatible and appropriate and can you give any hints to improve the setup?

Reginald Morley

A The equipment will work, but it's likely that the bottleneck is your dial-up modem – the software makes allowances by slowing down the speed of picture updates, but it still needs bandwidth for the video. You may be better off not using video and using audio only. You should also run the Audio Tuning wizard from the Tools menu in Messenger to make sure it's set up correctly (see screenshot 9). Also, close any programs that might be using your Internet connection in the background – with a dial-up connection, you need it all for your chat. If you want to chat regularly, consider a low-use ADSL connection – it will probably still be cheaper than calling New Zealand from your landline.



Using a form to solicit feedback from your website may not be quite as convenient for visitors, but it does stop spammers harvesting your address



Make sure you've run the Audio and Video Tuning wizard before making net calls; even so, a dial-up modem may not provide enough bandwidth

CONTACTS

All of our experts welcome your queries, simply respond to the appropriate address below:

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 Windows: win@pcw.co.uk
 Word processing: wp@pcw.co.uk

Please do not send unsolicited file attachments.



Gordon Laing has been a hardware enthusiast ever since his first Sinclair ZX80 and, as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing

Tuning and tweaking Media Center

How to record and edit TV programmes even when you're away

Microsoft's Windows XP Media Center Edition may have been designed only to be pre-installed on new systems, but its extended licensing has allowed many enthusiasts to try it on their own PCs. I took the plunge a few months ago and have found it to be an excellent option for those willing to obey its strict requirements – there's a full explanation of how to install this in March and April's Hardware columns.

In the meantime, XP Media Center Edition has also proven surprisingly tweakable. Microsoft's already released a set of MCE Powertoy's and a wealth of third-party plug-ins and utilities have been developed to extend its capabilities. Many are discussed on the Green Button forums at www.thegreenbutton.com/community, but what follows are the ones I've found useful. They will all work on the 2005 Edition whether you've built your own system or bought one ready-made.

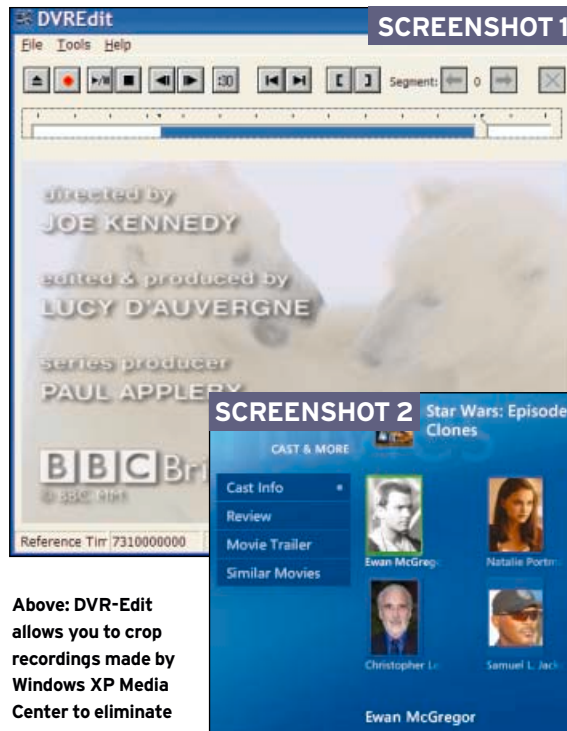
Editing TV recordings

One of the great things about a media PC with plenty of disk space is the amount of padding you can employ on either side of a scheduled TV recording. While protecting you against late-running broadcasts though, fast-forwarding through to the end of the previous show can be annoying, especially if you intend to watch the program again.

The answer is, of course, to manually edit the video file, but few if any commercial editing programs can recognise the proprietary DVR-MS format used by Media Center for TV recordings. While these files contain standard mpeg2 video, they also embed program information and optional copy protection.

Luckily, there's a neat, free tool, which can open and edit DVR-MS files, allowing you to crop padding or commercial breaks if desired, all without transcoding. This DVR-Edit program (see screenshot 1) can be found by clicking the Download Center link at www.thegreenbutton.com. Note that the program's menu option to convert DVR-MS files into mpeg2 has not been implemented.

Another useful tool available to download from The Green Button is DVR-2-WMV, which can convert Media Center DVR-MS files into the



Above: DVR-Edit allows you to crop recordings made by Windows XP Media Center to eliminate padding before and after the show, along with commercial breaks

Right: My Movies is a plug-in for Windows XP Media Center Edition which lets you view cast, crew and cover information for DVD movies, just like you can with audio CDs

wmv video format. This allows you to compress recordings, which could prove useful if your collection of unwatched shows is filling your disk.

Cast and crew

We've come to expect artist and title information from every CD we insert into our PCs, but what about DVD movies? Believe it or not, similar online databases exist which can reveal the entire cast and crew of an inserted DVD, along with links to other work they've done.

If you would like to access this information using Media Center, go to www.binnerup.dk/mce/mymovies.htm and download a copy of either My DVD Collection (for Media Center 2004) or My Movies (for Media Center 2005) (see screenshot 2). This program integrates itself on the standard Media Center menu and retrieves cast, crew and genre information for DVDs, which are either inserted or previously ripped to your hard disk (do remember that ripping DVDs onto your hard disk infringes UK copyright law).

LCD and VFDs

Almost every consumer set-top-box, DVD player or hifi features some kind of small display, showing information about what's playing and media PCs

should be no different. I know you can use your TV for control and media information, but sometimes you want to glance at the unit to see how long something's been playing, without flashing the details up on the screen and distracting every viewer.

Annoyingly, though, there's no support built into Media Center to drive these displays, forcing PC manufacturers to either develop their own, adopt third-party solutions or simply not bother. At times like these thank goodness for enthusiasts who

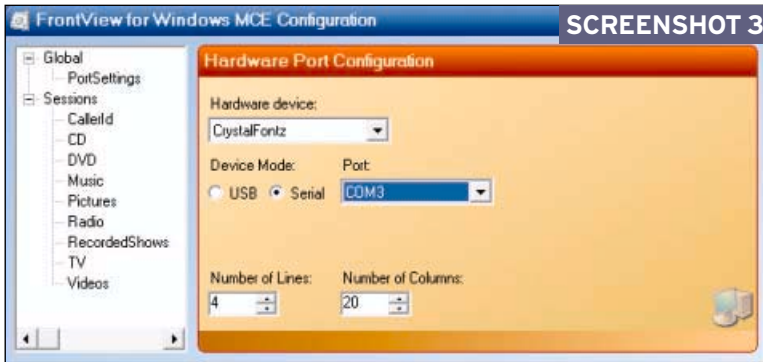
take it upon themselves to develop their own solution. Back in November's Hardware column I tested Leto's excellent LCD Module for Showshifter, and now it's time to thank Matheny for his Frontview for Media Center plug-in. Download it from www.mathenys.net/frontview (see screenshot 3).

At the time of writing, there were two versions available: version 1 was complete, but only supported parallel port VFDs, while the newer version 2 added support for serial and USB displays, but was still in beta form and required a little tweaking. Hopefully by the time you read this, final code for version 2 will be available.

I tested Frontview using a Crystalfontz 634 LCD, bought direct from www.crystalfontz.com. This is controlled and powered by a USB interface, although the Crystalfontz drivers allow it to be addressed by a virtual Com port – handy for other programs, which will only talk to old-style serial displays. Either way, I'd still need Frontview version 2 to drive it; I installed the latest 2.03 beta.

After selecting your display type and connection in Frontview's port configuration page, the screen should spring into life, showing 'Media Center' with the current time. Sadly, mine didn't do a thing, but this was due to a well-documented problem on the Green Button forums, which will be fixed in a later version.

To fix it on this version of the software, run Regedit and expand the entry HKEY_CURRENT_USER\Software\FrontView for Windows MCE\PortSettings. Now just change the PortAddress to the actual number



Frontview is a utility which drives LCD or VFD displays with information from Media Center PCs. This screen shows port settings for a Crystalfontz display

of the Com port your display is connected to (whether virtually or physically). Windows' Device Manager stated my Crystalfontz display was virtually-mapped to Com3, so I entered the number 3 into this section of the Registry and the display lit up immediately. You may need to perform this edit each time you make a change to the Frontview configuration, but hopefully it will be fixed by the time you read this.

Frontview also behaved when the system came in and out of standby, although in order to preserve the fanless S3 suspend-to-Ram mode, you may need to connect a USB display to the same USB controller as your Media Center Remote control – that is, to the USB port next to it. When I connected my display to a different USB port, the system would only standby to noisy S1 mode.

Remote scheduling

One of the killer applications for using an Internet-connected media PC is the possibility of scheduling new TV recordings from a remote location. This is invaluable if you're out and have forgotten to record something or if you're away from your Media PC for a longer period than the Electronic Programming Guide (EPG) is available. Microsoft is currently trialling a remote control system for Media Center Edition PCs, which works through the MSN website. It's only supporting users in the US at the moment and, even then, is still a beta program.

One solution you might wish to try is remote-controlling your Media Center PC using Windows' Remote Desktop Connection on another system – see the Communications section under Accessories in your Start menu (see screenshot 4).

When you fire up a remote connection to your Media Center PC, you may receive a message saying Media Center is not supported by this kind of link, but on my system I found double-clicking the icon restarted the interface and allowed me to schedule new recordings using

the guide. It's not as flexible as a web-based interface, but with no release date for MSN Remote in the UK, it's one of the only options available.

Coming out of standby

Finally, if your Media Center PC comes out of standby to the standard Windows XP login screen, you'll know how annoying it is to have to click on your username and, in some cases, enter a password before being able to watch or record TV. This can normally be solved by opening the Power Options control panel, clicking on the Advanced Tab, then unchecking the box to 'Prompt for Password when computer comes out of standby'.

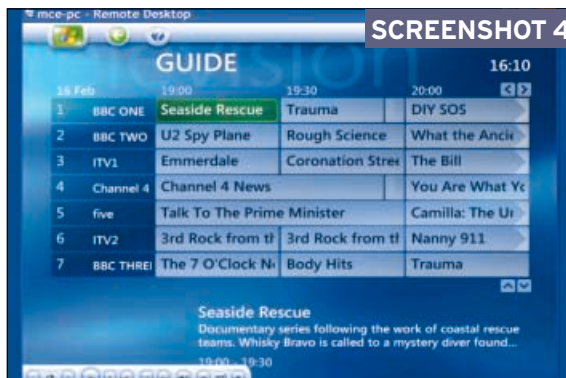
In practice, on my own DIY Media Center PC, I've found this doesn't work 100 per cent, but if the machine was put into standby from the Media Center interface, it will normally wake up and return to the same screen.

Road test

At the time of writing I'd been running Windows XP Media Center Edition 2005 on my own home-built system for over three months. As someone who hates missing their favourite shows, this has been a carefully monitored trial period with my Pace Twin set-top box doubling-up for essential recordings. As it turns out, though, it's not the PC's reliability which has been shown up, but my Pace box.

During this time, the Twin missed several shows, exhibited idiosyncrasies and was restricted to its 10-hour

Windows XP's Remote Desktop allows you to connect to a Media Center PC and schedule new recordings using its Electronic Programming Guide (EPG)



recording capacity. In contrast, the Media Center PC has only fallen over once, ironically thanks to an own-goal by Microsoft when a critical update downloaded in my absence closed down the program and demanded a manual restart. Apart from this, the system has behaved impeccably.

Of course, the security update problem illustrates a big issue with using Windows PCs for this. However slick the user interface may be, it's still complex underneath, running on a platform which is regularly under attack. Even if your machine doesn't crash of its own accord, there are plenty of things which can go wrong. Sadly, beyond switching to Linux or hoping the techies at Redmond stay ahead, there's not a lot you can do. I should point out that, over the past three months, my consumer-friendly embedded set-top box proved less reliable than the media PC.

What next?

The next step for my home-brew Media Center PC project is to reduce its power consumption. As a highly specced PC it demands 400w, but this seems like overkill for a device designed to record TV. Of course, if you follow Microsoft's minimum system requirements, there appears to be little way around this, but a recent demonstration proved it might not require such powerful components.

Tranquil has launched a dual-tuner Media Center 2005 PC, based on Via's latest Epia SP13000 Mini-ITX mainboard. This Epia may be Via's fastest yet, but the model used by Tranquil still only sports a 1.3GHz C3 processor and integrated graphics – both way below Microsoft's minimum requirements.

Nevertheless, Tranquil claims MCE runs smoothly and, thanks to the Epia specification, it can do so silently, while consuming less than 100w.

While lacking the processing muscle to decode High Definition video, this configuration sounds ideal for recording and playback of TV shows. I've already sourced an Epia SP13000 and hope to put together a similar system in the future. I'll also revisit an earlier VGA to RGB Scart project to achieve the best possible connection between a media PC and a UK TV set. If you've had any good or bad experiences with Media Center PCs, I'd love to hear from you.

CONTACTS

Gordon Laing welcomes your comments on the Hardware column. Email him at: hardware@pcw.co.uk. Please do not send unsolicited file attachments.



Gordon Laing has been a hardware enthusiast ever since his first Sinclair ZX80 and, as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing

How far can you push a Pentium III?

When it comes to overclocking, it seems not all processors are created equal

I have received many letters asking about the overclocking potential of Pentium IIIs, so this month I'll look at a particular configuration that will apply to many owners. As always, be aware that overclocking will push components further than they're designed to operate. It will invalidate your warranty and we cannot be held responsible for any damage caused to your components.

Bill Lawson has a PC with an Intel Pentium III E running at 600MHz and wonders how far it can be overclocked. The E designation is important to overclockers as it identifies Bill's chip as being a Coppermine model manufactured using Intel's 0.18micron process. Earlier 600MHz Pentium IIIs without the E designation employed Intel's Katmai core and a 0.25micron process.

Each manufacturing process has an upper limit as to how far it can be reliably clocked. As this limit is approached, the manufacturer normally switches to a finer process with more headroom. There are additional factors involved, but for now it's a good indicator of how far a processor can be pushed.

The 0.25micron process used to produce the first Pentium IIIs was approaching its limit at 600MHz and was the fastest speed Intel used for the original Katmai core. Consequently, 600MHz Katmai Pentium IIIs don't have a great deal of headroom for overclocking. In contrast, the 0.18micron process employed by Intel for Pentium III Coppermines was used to produce chips clocked beyond 1GHz.

The 600E in Bill's machine runs on a 100MHz front-side bus (FSB) using a fixed clock multiplier of six times. Since this multiplier is locked, the only way to overclock the CPU is to increase the FSB. Increasing the bus to say 110MHz would, in theory, clock the processor at six times 110, or 660MHz.

Unfortunately, the BX chipset used here drives the memory, AGP and PCI buses as fixed multiples of the FSB. If this is set to 100MHz, the memory, AGP and PCI buses are driven at multiples of 1X, 2/3X and 1/3X, resulting in speeds of 100MHz, 66MHz and 33MHz respectively.



The circuit diagram of Intel's Pentium III processor, launched in 1999. Later versions running at 600MHz or higher proved particularly good for overclocking experiments, but some PC systems will prevent you from adjusting bus speeds

Increasing the FSB to overclock the processor would, therefore, also push the memory, AGP and PCI buses beyond their guaranteed specification. Consequently, when overclocking this kind of PC, you must be aware of the impact across the entire system.

In practice, though, BX chipset systems proved to be particularly good for overclocking. Most AGP and PCI components can tolerate being driven slightly harder than normal, and the only component that will really complain is the memory. If Bill's PC has PC100 memory, then it will be rated to operate no faster than 100MHz. To give him the best chance of a successful overclock, he should fit PC133 memory, allowing it to work at bus speeds up to 133MHz. As with all overclocking experiments though, it's best to start small with the minimum bus increases possible.

Dell restrictions

At this point, the owners of a similarly specified system should be able to enter their Bios or swap a motherboard jumper to change the FSB and start overclocking. Unfortunately for Bill, his system was made by Dell, which removed any user option to adjust the FSB – this is fairly normal practice for most large PC manufacturers, which don't believe their customers should be tweaking.

Annoyingly, there's virtually no way round this. Some desperate users have identified the motherboard in their Dell system as a rebranded model from a manufacturer such as Intel. They've then downloaded the Bios for the Intel-branded

model and flashed their Dell version in the hope that it will unlock certain features. This is serious stuff, and I wouldn't recommend it – if the Bios doesn't work, you could end up with a PC that refuses to start up properly, if at all. Besides, most Intel-branded motherboards are, not surprisingly, bereft of overclocking features, so using different Bios code may not present the options you're after.

In fact, about the only option for people with locked systems is to see if they can use a software overclocking tool. H-Oda, who authored the legendary WCPUID tool for checking CPU models, (see www.h-oda.com) also wrote a utility called Soft FSB in the late 1990s. He's long since stopped development and removed it from his website, but it's still hosted by others such as www.majorgeeks.com/download434.html.

Soft FSB runs from Windows, detects the FSB settings offered by motherboards it recognises and allows you to manually adjust them. If your motherboard isn't recognised, you're out of luck, but owners of systems built before 2000 should be more successful. My own Asus P2B-based BX-system has long since retired, so I couldn't try it out, but I can confirm that it had great overclocking potential – in August 2000's column I had it running a number of Pentium IIIs much faster than they were supposed to.

Bill's overclocking opportunities may have been hobbled by Dell, but utilities like Soft FSB could give him the chance to tweak. Owners of less restrictive Pentium III systems should instead use their Bios or motherboard jumpers to manually increase the FSB speed a small amount at a time to see how far their system can be reliably pushed. The models with the greatest potential seemed to be Pentium IIIs designed for a 100MHz bus, but coupled with PC133 memory.

CONTACTS

Gordon Laing welcomes your comments on the Overclocking column. Email him at: overclock@pcw.co.uk. Please do not send unsolicited file attachments.

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Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family

Putting the boot.ini

Edit and customise your boot-up options and view pdfs in your Internet browser

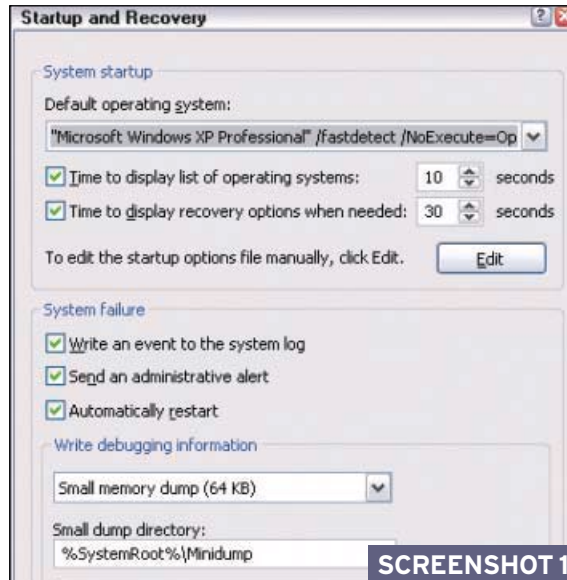
Back when all was 16bit and Windows 3 ran in 2MB of Ram and 30MB of disk space, practically all of Windows' settings were held in plain text .ini files, which could be edited in Notepad. Win.ini held the software settings, desktop settings, fonts and printers. System.ini held mostly hardware settings and there was a slew of other .ini files covering Control Panel, the File and Program Managers, network settings and so on. Since the advent of Windows 95, these settings have been held in the Registry and can be accessed via the Registry Editor, Regedit.exe. Ini files are not entirely dead, however. The Opera browser still uses .ini files for customisation and Windows XP still has win.ini and system.ini in case any 16bit applications need them.

One important .ini file remains in Windows 2000 and XP; it controls what happens when Windows starts and is called boot.ini. If you have more than one version of Windows installed or have the Recovery Console installed as a boot option, you'll see a list of start-up options appear between the Bios screen and the Windows XP splash screen. This will have a default action selected and will execute it after a delay of 30 seconds, unless you use the arrow keys to select another option before the timeout.

You can edit the boot.ini file in several ways. You can load it into Notepad by finding it in the root of the boot drive or you can go to the Advanced tab of System Properties, click the Settings button in the Startup and Recovery panel. The dialogue gives a few options, such as the default action and the timeout delay, and clicking the Edit button loads the file into Notepad (see screenshot 1).

A third option is to run the System Configuration tool (msconfig.exe) and turn to the boot.ini tab. This will let you view entries, move them up or down, add switches and change the timeout, but it won't let you edit individual lines (see screenshot 2). There is also a button for checking the validity of all boot paths, but beware as this is fallible. It reported a working Recovery Console path as defective on our test machine.

There is a fourth method, which I'll leave as an exercise for the reader – type `BOOTCFG /?` at a command



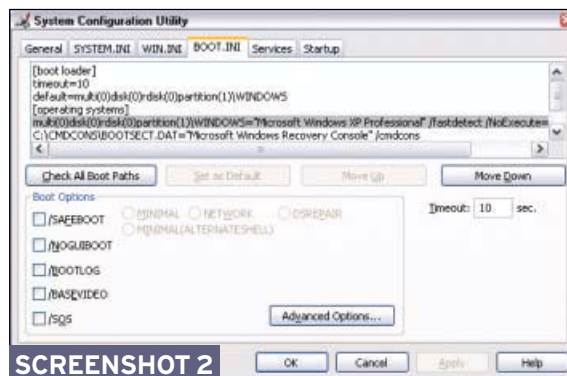
SCREENSHOT 1

Editing the boot.ini file lets you set options such as timeout delay

prompt for further information. Whichever route you choose, first you need to be logged on with administrator rights and, second, you must know what you are doing. It's also advisable to back up the file before editing. Note that even if you don't have the list appearing at boot, you'll still have the boot.ini file, containing just the one option. If you have a normal installation with IDE drive controllers and Windows XP installed on the C: drive and the Recovery Console as a start-up option (see April's column for how to do this), then you should see something like this:

```
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
[operating systems]
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Microsoft Windows XP Professional" /fastdetect /NoExecute
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /cmdcons
```

You can edit individual lines by accessing boot.ini from the System Configuration utility



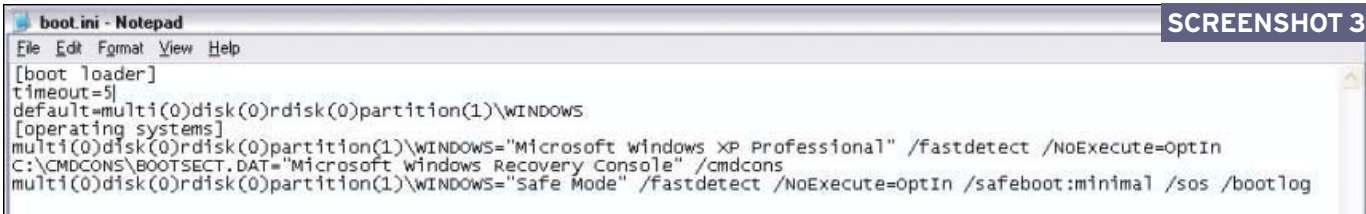
SCREENSHOT 2

```
"Microsoft
Windows XP Professional" /
/fastdetect /NoExecute
=OptIn
C:\CMDCONS\BOOTSECT.DAT="
Microsoft Windows Recovery
Console" /cmdcons
(Key: ✓ code string continues)
```

The first section, [bootloader] should be self evident, giving the timeout delay in seconds and the default boot command, should the timeout end or the user presses Enter. You can set both from the System Properties dialogue, or the System Configuration Tool. Although it's useful to have the Recovery Console available as a boot option, we hope you never have to use it, so chopping the timeout down to five seconds or so, will cut 25 seconds off booting and still give you time to choose the Recovery option if needed.

The second section [operating systems] lists the options available. Looking at the first line, multi() and disk() are usually both zero on IDE or EIDE controllers. Rdisk() refers to the number of the disk on the controller – 0 being the first and 1 being the second. Partition() refers to the partition on the physical disk where the system will boot from. This time the numbering starts at one, not zero, which may be why they are called logical partitions. Following this is the path to the Windows folder on the disk – normally \Windows. Following the equals sign, enclosed in double quotes, is the text you will see on the list – you are free to rename this as you see fit. If you need to install Windows to a new partition, then you might want to avoid having two default entries of 'Microsoft Windows XP Professional' and instead have 'New Windows on D:' and 'Dodgy Windows on C:'.

Finally, there may be switches, each preceded by a space and a forward slash. The /fastdetect switch makes Windows skip parallel and serial device enumeration (only needed in NT4). The /NoExecute switch is part of the Data Execution Protection safety feature introduced with XP SP2. There are more switches, mainly only of interest to developers, but if you're curious Mark Russinovich has compiled a comprehensive guide at www.sysinternals.com/ntw2k/info/bootini.shtml. In an ideal world, you shouldn't have to edit boot.ini, but



Above: Adding Safe Mode to boot options

the world of Windows often falls short of ideal.

Among this month's queries was one from Geoffrey Charrett. He had had a dual-boot system with Windows 98 on C: and Windows XP on D:. He wanted to get rid of Windows 98, install XP to C:, then get rid of the XP installation on D:. However, he ended up only being able to boot to the D: installation. Examining the boot.ini file revealed the following under [operating systems]:

```
multi(0)disk(0)rdisk(0)
partition(2)\WINDOWS="
Microsoft
Windows XP Home Edition"
/fastdetect
C:\=WINDOWS
```

Changing this to:

```
multi(0)disk(0)rdisk(0)
partition(1)\WINDOWS=
"MS Windows
XP C Drive" /fastdetect
multi(0)disk(0)rdisk(0)
partition(2)\WINDOWS=
"MS Windows
XP D Drive" /fastdetect
```

restored access to both installations.

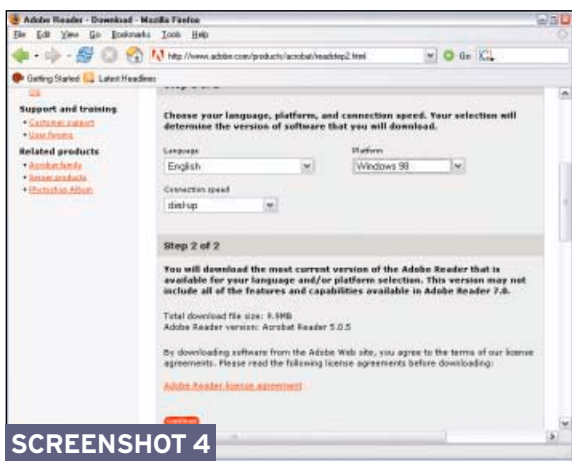
Kenneth Jones found that following a hard disk replacement under warranty, his new disk had a hidden recovery partition and he could no longer get into Safe Mode by pressing F8. There is a crafty way to add Safe Mode to the boot list (see screenshot 3). All you need to do is add the following line under [operating systems]:

```
multi(0)disk(0)rdisk(0)
partition(1)\WINDOWS="
Safe Mode"
/fastdetect/NoExecute=
OptIn /safeboot:minimal
/sos
/bootlog
```

If you want network support in Safe Mode, then replace 'minimal' with 'network'. The /sos and /bootlog options aren't necessary, but will make Windows enumerate device drivers and create a boot log named Nbtlog.txt in the Windows folder.

Read on

We've had a couple of queries on the Adobe Acrobat Reader. Frans Van de Vegte was happily using version 5 on his Windows 98 PC and tried to



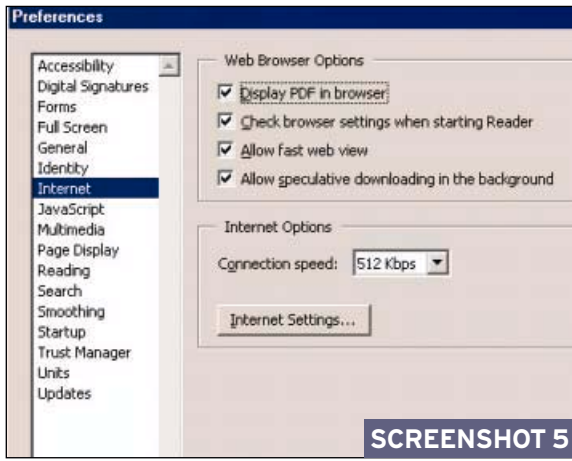
SCREENSHOT 4

install version 6.01 from a PCW CD. He got the message 'This operating system is not supported. Set-up will now terminate.' This is one of those rare error messages that means exactly what it says. If you want to install the Acrobat Reader under Windows 98, then the latest version you can use is 5.05. You'll find it at www.adobe.com – there's a selector to help you choose the correct version for your OS (see screenshot 4).

The Adobe website will help you choose the right version of Acrobat

On a related matter, several readers have asked where the option for showing pdfs inside Internet Explorer (IE), rather than in a standalone Acrobat window, is stored. Searching through the many items in Internet Options doesn't appear to reveal this. The answer is that it is not an IE option, it is an Acrobat option. If you run the standalone version, then go to Edit, Preferences, then select Internet from the list on the left – you will find the option to 'Display PDF

You can choose to display pdfs in Internet Explorer



SCREENSHOT 5

in browser' (see screenshot 5). Note that this only applies to pdfs that you access from within IE or another browser. For example, on websites – if you double-click on a locally stored pdf it will open in the standalone reader.

Gullibility virus

A reader wrote to ask if the following email purporting to come from Microsoft was genuine. Note that I have edited this down considerably, but preserved the gist:

'Hello Microsoft user, we here at Microsoft would like you to still receive your normal computer updates, That Will protect your computer from Viruses and spyware. We have noticed A lot of people are illegally Using our services Without paying for their Windows Operating System. Therefore we've made a web site so you can update or validate your windows serial and credit card information. If you do not comply with our policy, windows will ask you to reactivate your serial number, and it will become invalid. So you will lose any information on your computer. Your Credit Card will not be charged. We use your credit card information to validate your windows system.'

Well, let's just run that through a reality check. Starting with style, it's extremely unlikely that anyone at Microsoft would ever survive spelling Windows without an initial capital. The profusion of gratuitous capitals elsewhere is also suspect. As for content, not even Microsoft would have the temerity to cold-call asking for your credit card number or threaten that you would 'lose any information on your computer'. And as for 'your credit card will not be charged' – pull the other one.

I'm sure that few PCW readers would be gullible enough to take the message seriously, but you never know. That wraps it up for this month – I need to send a reply to a gentleman in Lagos who is going to make my fortune.

CONTACTS

Tim Nott welcomes your comments on the Windows column. Email him at: win@pcw.co.uk. Please do not send unsolicited file attachments.



Barry Shilliday has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time prefers to travel the world – and snap it with his camera

Handling removable storage with Gnome

Improvements in desktop Linux aim to make hotpluggable hardware a realistic option

Desktop Linux has improved considerably during the past couple of years. It's hard to go a month without finding an article online about how movements are being made towards the global acceptance of Linux in this respect or another, which lists the reasons it's just not quite ready enough.

Certainly, for standard day-to-day use – checking email, browsing the web, writing documents – there are few who would disagree that it's any more difficult to use than Windows XP or Mac OSX, and in a number of ways there are arguments to suggest it's easier. Perhaps one of the most common flaws, up to now, has been the way in which removable storage devices are handled by Linux and its common desktops KDE and Gnome.

What do we mean by removable storage devices? These could be anything from a simple floppy disk or CD, to a digital camera, mp3 player or USB flash drive. In Linux, just like all forms of Unix, a hardware device must be mounted – linked to a position in the filesystem – before it can be used. This doesn't pose any real problem for a device like the floppy drive, as, to all intents and purposes, it is set – the drive is represented by a fixed device file (/dev/fd0). For hotpluggable devices – those that can be inserted and removed from the computer while it's still running – like USB drives, things aren't so easy. With a floppy drive, while you can swap the disk whenever you like, the actual drive remains part of the system from startup to shutdown. This isn't true for the majority of USB devices.

Let's look at how Linux handles devices internally, and why there's such a problem with those that are hotpluggable. As you probably know, every hardware device needs a unique file found under /dev – what's known as a device node. When the kernel drivers are loaded, they search for any devices and either create the node, or connect the node to the appropriate device. For example, the IDE disk driver searches the IDE buses for any drives and assigns /dev/hda to the primary master device and /dev/hdb to the primary slave. Others include /dev/fd0 for the floppy drive, and /dev/psaux for the PS/2 mouse. These nodes may well

```
xterm - Shell - Konsole
Session Edit View Bookmarks Settings Help
usbcore: registered new driver usb-storage
USB Mass Storage support registered.
usb-storage: device found at 3
usb-storage: waiting for device to settle before scanning
Vendor: USB2.0 Model: CardReader CF RW Rev: 0814
Type: Direct-Access ANSI SCSI revision: 00
Vendor: Crucial Model: Gizmo Rev: 1.00
Type: Direct-Access ANSI SCSI revision: 01 CCS
usb-storage: device scan complete
usb-storage: device scan complete
Attached scsi removable disk sda at scsi2, channel 0, id 0, lun 0
SCSI device sdb: 1001952 512-byte hdwr sectors (513 MB)
sdb: assuming drive cache: write through
SCSI device sdb: 1001952 512-byte hdwr sectors (513 MB)
sdb: assuming drive cache: write through
/dev/scsi/host3/bus0/target0/lun0: p1 p2
Attached scsi disk sdb at scsi3, channel 0, id 0, lun 0
gentoo root #
```

When a USB device is inserted the kernel drivers detect the hardware

exist whether the hardware is present or not – but, of course, if you try to access a device that doesn't exist, the kernel will return an error. You could try this by attempting to partition a non-existent hard drive, using 'cfdisk /dev/hdz' for example. Cfdisk returns the message 'Fatal error: cannot open disk drive'.

So far so good. We know where to find the devices and how to mount them. This information is contained in the filesystem table, which is found at /etc/fstab. The format is a simple text-based database of device nodes and mount points, together with any necessary options. In order to mount devices without specifying the full details, there needs to be an entry in here. Also, it's impossible for any use other than the superuser (root) to mount a device, unless

there's an entry in this file. Here we can begin to see a problem: should a user have to login as root and edit the /etc/fstab file every time they plug in a USB flash disk?

You may see an entry such as this in /etc/fstab:

```
/dev/fd0 /mnt/floppy ✓
auto noauto,user 0 0
```

(Key: ✓ code string continues)

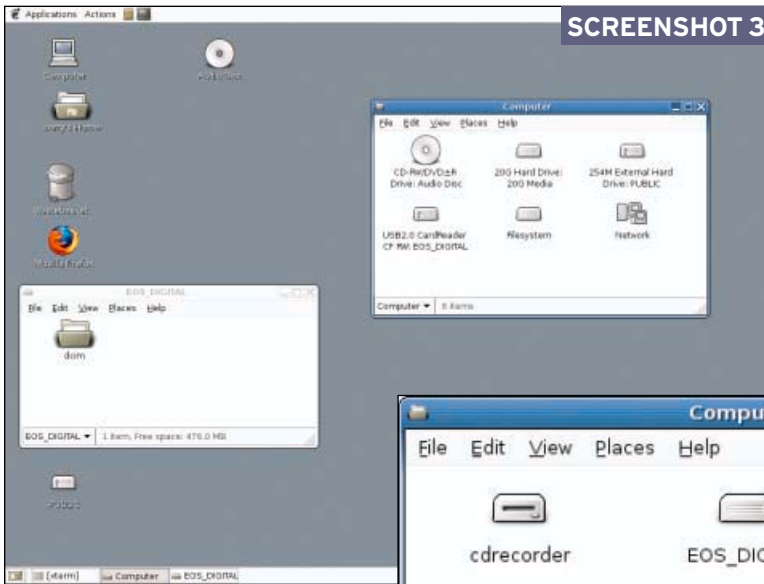
This line means that the floppy drive is mounted at /mnt/floppy and the filesystem on the disk is automatically detected (though it's almost always Fat). The special option 'noauto' means that the system won't attempt to mount the floppy disk on bootup – it wouldn't make sense to do so. The 'user' option allows any user to mount and unmount the floppy disk. Anyone now just needs to run 'mount /mnt/floppy' and the disk is accessible.

Hal manages the /etc/fstab file, maintaining full compatibility with traditional systems

It's simple to configure KDE and Gnome to perform this action with a mouse click on an icon.

For static devices like these, this has been fine – more or less. However, when the Unix mount system was conceived, people weren't particularly concerned about hotpluggable devices that hadn't yet been

```
xterm - Shell - Konsole
Session Edit View Bookmarks Settings Help
gentoo root # /etc/init.d/hald start
Starting D-BUS system messagebus... [ ok ]
Starting Hardware Abstraction Layer daemon... [ ok ]
gentoo root # tail -n 2 /etc/fstab
/dev/hda3 /mnt/windows vfat user,noauto 0 0
/dev/hdc /media/cdrecorder auto user,exec,noauto,managed 0 0
gentoo root # # insert the pen
gentoo root # tail -n 2 /etc/fstab
/dev/hdc /media/cdrecorder auto user,exec,noauto,managed 0 0
/dev/sdb1 /media/PUBLIC vfat user,exec,noauto,iocchars et=utf8,noatime,sync,managed 0 0
gentoo root # # insert the compact flash card
gentoo root # tail -n 3 /etc/fstab
/dev/hdc /media/cdrecorder auto user,exec,noauto,managed 0 0
/dev/sdb1 /media/PUBLIC vfat user,exec,noauto,iocchars et=utf8,noatime,sync,managed 0 0
/dev/sda1 /media/EOS_DIGITAL vfat user,exec,noauto,iocchars et=utf8,noatime,sync,managed 0 0
gentoo root #
```



SCREENSHOT 3

Gnome 2.8 and above has full integration with the hardware abstraction layer, providing a view comparable to Windows XP or Mac OSX

distributions to try and handle devices completely, but this was a clumsy attempt to hack the existing system. Hotplug is responsible for all kinds of hardware, such as printers, network devices and digital cameras. You can find out more at <http://linux-hotplug.sf.net>.

Udev is a program that helps to maintain device nodes. It ensures that the devices are created and removed appropriately – fixing the access permissions and creating any aliases necessary. For example, it's possible to use udev to create a node called /dev/mydevice when a particular device is inserted. It can use special details such as serial numbers and manufacturer names to determine what kind of device is present. Udev works with hotplug in order to make sure all of the nodes are in sync with any hardware

invented. The addition of the 'user' option helped to get around managing CD and floppy drives, but falls apart when it comes to this newer hardware.

USB storage and kernels

The kernel's USB interface allows it to detect any device that's plugged in. Other drivers are then required to control the device. In this case, it's the 'usb-storage' driver. The kernel must use a disk subsystem to handle the device, so the driver works together with the SCSI system, meaning that each device is treated as if it were a real SCSI drive. The kernel uses /dev/sd nodes for SCSI disks. As with IDE drives, the first SCSI disk is /dev/sda, the second /dev/sdb and so on. This means that when you plug in a USB flash drive, assuming there are no real or other emulated SCSI drives on the PC, the device is assigned /dev/sda.

There would be nothing stopping you from using the /etc/fstab file as above to handle the drive. We have done similar things in past columns when looking at removable storage. If the device is removed, any attempt to mount the drive results in a 'disk not found' error, which isn't a problem at all. When the device is re-inserted, /dev/sda is connected back to the device, and everything works perfectly. However, what happens if you remove the flash device, and insert an Ipad instead? Now /dev/sda refers to the Ipad, and not the flash disk. The chances are that the partition layout is different and the /etc/fstab entry will have to be altered. You may then want to plug in your flash device while the Ipad is still connected. Now /dev/sda points to the Ipad, and /dev/sdb to the flash



SCREENSHOT 4

Without the Hal daemon, Gnome reverts to using the traditional method of presenting drives

device. Immediately, the whole thing becomes unmanageable. Instead of just inserting devices and using them, you have to edit files or log in as root to mount them manually.

Take a look at screenshot 1 for a genuine example. Here you can see that a flash disk has been inserted. The usb-storage driver is loaded and it detects the inserted disk, but also a flash card reader that is installed on the PC. The reader is assigned to /dev/sda and the flash disk /dev/sdb. It's clear that trying to manage these devices using Unix's traditional mechanism isn't going to work, at least for the average desktop user.

Hal

There is a solution to all these problems, and it comes in the form of the hardware abstraction layer, or Hal. This concept is nothing new, but it's now being integrated into KDE and Gnome, making everything 'just work'. There are three levels to this new system: hotplug, udev and dbus. We'll look briefly at each of them.

The hotplug system has been around for a while, and was created to try and alleviate some of the problems with handling hardware. When something is added or removed from the PC, the kernel is immediately aware and runs the program /sbin/hotplug. This, in turn, runs through various scripts and programs that help to ensure that the device is handled correctly. Until recently, hotplug was used by some

plugged in and it uses a series of rules to maintain the nodes – the syntax is quite straightforward and easy to learn. Udev has no central website, but a search on Google will reveal many sources of information.

DBus is an interprocess communication system, which allows programs to communicate with each other. There are existing mechanisms within Gnome and KDE (Orbit and Dcop respectively), but these are not compatible with each other, nor with non-desktop related applications. Dbus is written more generally, independent of any other software, and allows any program to talk to another or to many others over a so-called bus. One such bus is the supplied 'system bus', which uses

'The hotplug system... was created to try and alleviate some of the problems with handling hardware'

Udev to provide an easy method of finding out when something is added to, or removed from, the PC. There's extensive information about Dbus at www.freedesktop.org/Software/dbus.

The final part of the Hal framework is the Hal daemon – Hald. This uses the Dbus system bus to monitor the complete hardware state of the computer. When a USB device is plugged in, Hal knows exactly what's



SCREENSHOT 5

present and what kind of hardware it is. It's then easy to perform any action based on that information, such as pop up a window to the user. Finally, when the desktop integrates with Hal, the framework is complete, and all of the issues go away.

Hal effectively does all the steps that you would have to do manually to manage a device. It adds an entry in /etc/fstab and creates a directory for the mount point. We can see this in an example (see screenshot 2). First we start up dbus and Hald – this would usually be done as part of the start-up procedure. Next, we look at the last two lines from the /etc/fstab file. Hald has already added a new entry for /media/cdrecorder, which relates to the CD/DVD drive on the PC. The 'user' option is present, so anybody can access the drive. Next, a USB flash disk is inserted and we look at the fstab file again. As you can see, Hal has detected the flash drive and found a partition on it, and has created the necessary entry in /etc/fstab.

Next, a compact flash card is inserted into the card reader. Instead of having to worry about whether it's going to be /dev/sda or /dev/sdb, Hal finds

With Hal it's easy to run commands based on what's inserted. Some defaults are set up, but you can change these with this program

Despite no direct support for Hal, KDE 3.3 can take advantage of Hal's /etc/fstab management

the card at /dev/sda and creates the entry for the partition /dev/sda1. What's more, in both cases, an appropriate directory is made in /media with a name that corresponds to the filesystem on the device. The user can now mount these devices by running the mount command (mount /media/PUBLIC, for example), or through a graphical desktop utility. When the devices are removed, Hald removes the entry in /etc/fstab and deletes the directory in /media.

Desktop integration

This is all extremely useful, but doesn't involve proper desktop integration – all of this takes place without a desktop running. The good news is that Gnome already has full Hal support. Provided the framework is in place (hotplug, udev and dbus) and the Hal daemon is running, Gnome will automatically use it and present a 'Hal-based' view of the drives. Take a look at the desktop in screenshot 3. The file browser (Nautilus) presents a view of the drives under the 'Computer' icon with full Hal support. The icons receive additional information depending on what's in the drive: an audio CD, for example. When a device is inserted, its icon appears in the view, and when mounted via a double-click, an icon appears on the desktop. Conversely, the icons disappear when the hardware is removed from the computer. It's not just the Computer view where this works – the integration is at a low level, so file browsers display Hal devices as well. Compare all of this to screenshot 4. Here, the Hal daemon is not running, so Gnome falls back to displaying the disks the old way. The devices are shown only as mounts, not in the much more user-friendly method provided by Hal.

With Hal, Gnome can additionally run programs when certain types of

devices are inserted, just as with Windows XP and Mac OSX. Select 'Removable Devices' from the Desktop Configuration menu and a window pops up like that shown in screenshot 5. While Hal is, of course, particularly useful with hotpluggable devices, it also manages the rest of the hardware, so it's easy to configure Gnome to act on CDs and DVDs too. A few programs are set up as standard, and this utility lets you change them to whatever you prefer.

KDE support

For KDE, the situation isn't as straightforward. At the time of writing, the current version of KDE was 3.3.2, which has no support for Hal. However, version 3.4 should be available by the time you read this, and this will have support included. Expect new Linux distributions to migrate to KDE 3.4 in the next couple of months.

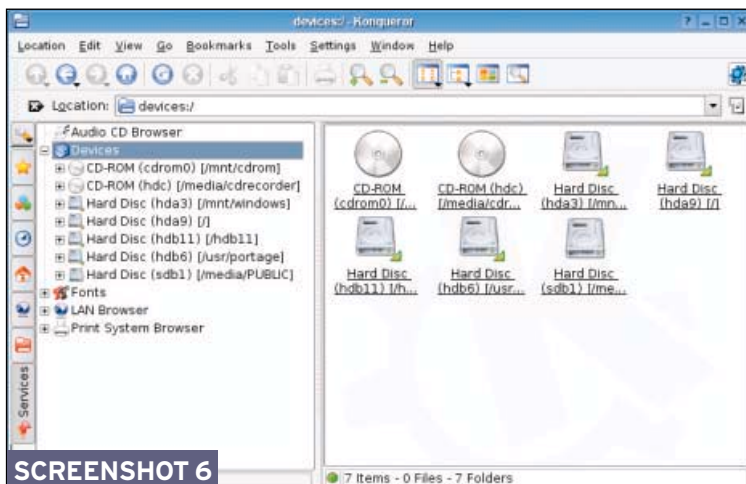
For older versions, it's not all bad news. Since the Hal daemon works independently of the desktop, it's still possible to take advantage of Hal despite the lack of full integration. KDE looks at the /etc/fstab file for information about the current drives on the computer (just like Gnome without Hal support) and when a device is plugged in, KDE becomes aware of its presence. The file is regularly checked in Konqueror (KDE's file browser), so there is no need to refresh the view. To access a device, enter 'devices:/' in the Location bar, or select the Devices menu from the left-hand pane in the browser window (see screenshot 6).

A green triangle on the icon indicates that the device is mounted. You can mount a device by clicking on the icon, which will automatically browse the files on the device too. Alternatively, right-click on the icon and select 'mount'. Before removing the device, you must unmount it first. Make sure no windows are open on the device, right-click on its icon and select unmount. If any browser windows are open on the device, you will not be able to unmount it.

While doing things this way isn't as attractive or user-friendly as Gnome, until you're using KDE 3.4, this is probably a good enough work-around, and is a considerable improvement on manually setting up the hardware.

CONTACTS

Barry Shilliday welcomes your comments on the Linux/Unix column. Email him at: linux@pcw.co.uk. Please do not send unsolicited file attachments.



SCREENSHOT 6



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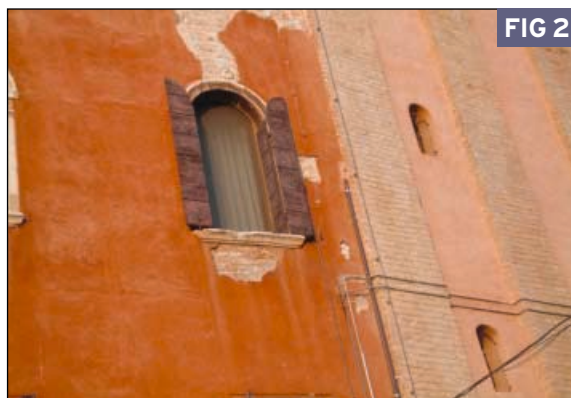
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Ken McMahon is a freelance journalist and graphic designer. His involvement with digital graphics began with a Commodore 64. He graduated to Macs and now works mostly with PCs. Draw your own conclusions

When making a copy isn't right

A simple watermark is all you need to protect your copyright on digital images



There's little, if any, noticeable difference between the original image (left) and one which has had a Digimarc watermark embedded with a strength of three

Given the proliferation of digital images on the web and the ease with which they can be copied, you might be forgiven for thinking they are copyright-free and their owners are happy for them to be used in any way you like. You would, of course, be wrong and might well have legal proceedings brought against you for unauthorised usage of a copyright image.

Looked at from the opposite perspective, you'd be upset if a photo you'd taken and uploaded to a publicly accessible website had been used without permission by someone else for their online store or product brochure.

As well as those who work professionally with images – web designers, photographers, publishers – copyright is an important issue for anyone who has uploaded photos to a web gallery from their personal collection or has seen an image and thought 'that's exactly what I need for my homepage'.

But how do you tell who owns the copyright on specific images and how do you make sure others are aware that you hold copyright for your images when you upload them?

Contrary to popular belief, you don't have to notify others that you hold copyright on the photos you take – it's automatically yours (unless you assign it to someone else). But including copyright information in your images leaves no doubt as to their ownership and gives potential purchasers a route to your door.

One way to do this is to use digital watermarking, a process that embeds an invisible code into the image pixel data. The most commonly used technology for digital watermarking is

produced by Digimarc corporation (www.digimarc.com). Using the Digimarc plug-in, a variety of applications, including Adobe Photoshop, Corel Photo Paint, Jasc Paint Shop Pro, Micrografx Picture Publisher and Ulead Photo Impact, can embed and read copyright information from watermarked images.

Digimarc

The watermark itself is invisible to the naked eye – Digimarc analyses the noise patterns in the image and embeds the copyright information within these bits. The result is a marginal increase in the amount of noise in the image, but nothing so severe as to cause a degradation in image quality (see figures 1 and 2). Figure 3 shows the difference between the two images more clearly.

Aside from the fact that it can't be seen, so doesn't obscure the image, other advantages of Digimarc are that the image can be compressed, cropped, rotated and edited in other ways without affecting the integrity of the watermark. Digimarc also works with printed images, so even

photos that have been printed and re-scanned retain the watermark.

Digital watermarking of images won't prevent people making unauthorised use of them, but it does mean that copyright and contact information is available. When the image is opened in an image-editing application the copyright message is displayed in the title bar.

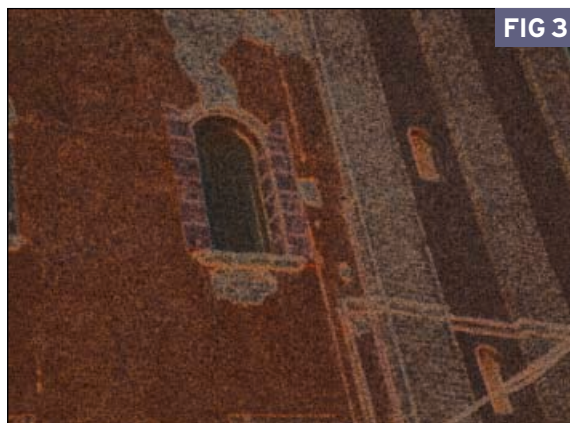
More detailed information can be found by reading the watermark using one of the applications mentioned, or the free reader, which can be downloaded from the Digimarc website. This displays the licence holder's Digimarc ID and a link to the copyright holder's website.

Digimarc can also locate and identify copyright transgressions, in the form of a web crawler service called Marcs spider. This searches the web and compiles a database of URLs where watermarked images are found. By matching the embedded image IDs with registered licence holders, Digimarc can provide subscribers with a list of their watermarked images, with the associated URLs (see screenshot 1).

You could then contact the website owners and ask them to remove your images or negotiate usage terms. In the event of non-compliance the next step would be legal action.

To see what an image with an embedded watermark looks like, go to the Corbis images website (www.corbis.com) and download any of the royalty-free thumbnails, then open the file in Photoshop or one of the other Digimarc-enabled applications mentioned earlier. In the title bar you'll see '© Corbis' followed by the filename (see screenshot 2). Select Filter> Digimarc> Read Watermark.

Superimposing the two images in Photoshop using the difference blend mode, then merging the layers and adjusting levels, produces an exaggerated view of how the watermarking process has affected the image



You'll see the Digimarc ID information and a web lookup button, which links to the Corbis homepage.

To embed a Digimarc watermark in one of your own images you need to register with Digimarc and pay a subscription fee. For individual use, this is based on the number of images you want to watermark. Either select Filter> Digimarc > Embed watermark in Photoshop and click the Personalise button, or open www.digimarc.com in your browser.

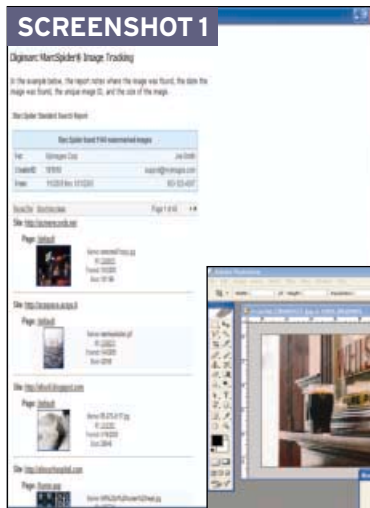
If you just want to see how the process works, select an option from the image information pulldown menu, check the required image attribute options and use the slider to set watermark durability from one to four. The lower settings produce the least visible increase in image noise, but the least resistance to watermark degradation as a consequence of image editing.

The Digimarc service for individuals is called MyPictureMark. There are four subscription levels – Personal, Portfolio and Collection allow watermarking of up to 100, 1,000 and 5,000 images respectively. The Personal subscription costs \$49 (£27.57 approx) and Collection is \$199. There's also a Professional level, which, for \$499, allows watermarking of 5,000 images and includes Marcs spider tracking. For businesses, Digimarc provides a range of services under the Imagebridge banner, which integrate batch watermarking and tracking with digital asset management systems.

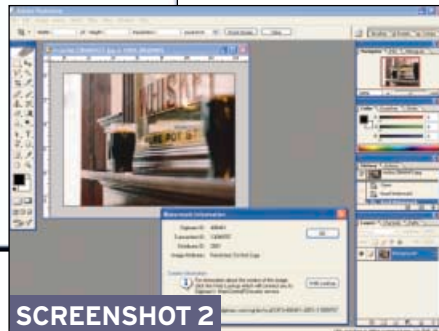
Other options

There are numerous alternatives to Digimarc, which operate in a similar fashion, though most are aimed at enterprise-level solutions. BayTSP.com (www.BayTSP.com) takes a different approach to Digimarc, analysing digital images and extracting a unique digital pattern identifier which it calls DNA. It also provides a tracking service and carries out infringement notification in compliance with the US Digital Millennium Copyright Act. BayTSP identifies and tracks music, video and software piracy in addition to still images.

UK company Signum Technologies (www.signumtech.com) produces Suresign, a watermarking plug-in suite for Photoshop. It sells individual licences for £120, at its discretion, to private, non-commercial, non-VAT registered individuals. For everyone else, the corporate-user licence is £620. Unlike Digimarc, there don't appear to be any limit on the number of images you can watermark. For high-volume users, there's Suresign



Left: Digimarc's Marcs spider service tracks down watermarked images on the web and provides a report detailing their whereabouts



Enterprise, an automated batch processing, embedding and detection application designed for networked Windows environments.

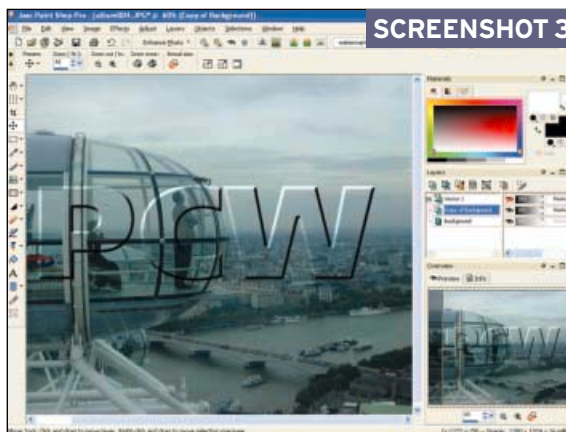
Other options include Eikonamark from Alpha Tec (www.alphatecltd.com) and Mediasec's (www.mediasec.com/html/en/) Syscop. Both these products can identify areas of a digital image that have been edited, possibly in an effort to avoid identification.

If your priority is purely to prevent unauthorised use of your pictures, a more direct (and much less expensive) option is to embed a visible watermark. Some photo libraries do this. In certain cases, unwatermarked thumbnails are offered as an incentive to register (but they are still invisibly watermarked).

There are several shareware applications that will add a visible watermark to your images and include batch-processing tools. Jpeg Wizard from Pegasus Imaging Corp (www.pegasusimaging.com/jpegwizard.htm), Tranz, from Fluid Vision Systems (www.fvs.co.uk/fvshome/) and Ablesoft's Batch it (www.ablesoft.nu/product/batchit/) are just three that come to mind. But this is such

Above: All thumbnail images on www.corbis.com are embedded with a Digimarc digital watermark

You can produce a visible watermark using Paint Shop Pro 9 or any other image-editing application that supports layers



SCREENSHOT 3

an easy thing to do in any decent image-editing application that plug-ins aren't worth bothering with.

DIY watermarks

Visible watermarks should be sufficiently obtrusive to render the image unusable, but must make identification straightforward. They need to be big and centrally located or you run the risk of them being cropped. At the same time, you don't want them to totally obscure the image so that you can't make it out.

This can be done by using blend modes, layer opacity and other effects to render the watermark partially visible. I'll run through how to do this in Paint Shop Pro 9, but you can do it just as easily in any other image-editing application that

supports layers. Recording your actions as a script means you'll be able to batch process a folder of images as part of your web production workflow.

Open the image you want to watermark, duplicate the background layer and, using the text tool, create your watermark logo. If you want to include the © copyright symbol, type 0169 on the numeric keyboard, while holding down the Alt key.

With the 'Vector 1' text layer active, choose Selections>From Vector Object to make a selection from the type, then click the Copy of Background layer in the Layers Palette and select Effects>3D Effects>Inner Bevel. Finally, click the 'Vector 1' layer's visibility button in the layers palette to turn it off, render the original type invisible and press Ctrl & D to get rid of the selection.

You now have a copy of the original image in a new layer with a bevelled watermark. You can use the Layer Opacity slider to reduce the visibility of the watermark by blending it with the unaltered layer below (see screenshot 3).

If you want to apply the same watermark to lots of images, record a script and use File> Batch> Process to apply the watermark to a folder of images. If you want to apply different watermarks, you can either re-record the script for each one or save the type selection as an alpha channel and load the appropriate one when you record the script.

CONTACTS

Ken McMahon welcomes your comments on the Digital imaging & video column. Email him at: digitalimaging@pcw.co.uk. Please do not send unsolicited file attachments.



Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family

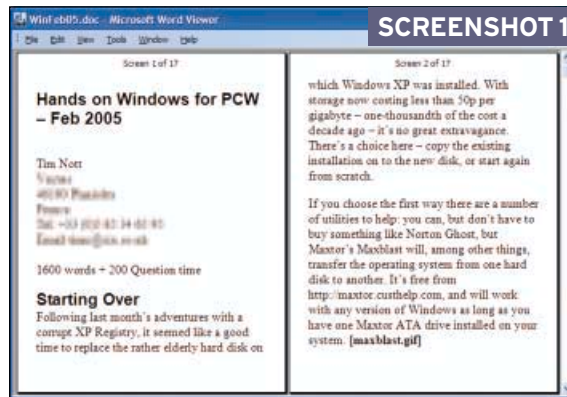
Word is not the only fruit

A new Word Viewer appears and MSN Deskbar goes head to head with Google Search

Regular readers will notice that this column is overwhelmingly about Microsoft Word. This isn't an editorial policy, nor am I encouraged in any way by Microsoft to make it that way. It's just that over 99 per cent of reader feedback and queries concern Word. It may be because users of other word processors – and there are plenty – find they either don't have any problems or that the company's technical support is adequate for their needs. But we'd like to see some variety, so come on all you Ability, Word Pro, Wordperfect, Star/Open Office, Think Free and other product users – let's hear from you. Tips, queries and advocacy all welcome.

For those of you not using Word, practically any word processor can read Word documents. However, Microsoft has updated a useful tool to replace the Word viewer of Word 97 days. With this you can read (but not edit) files in Word 97, 2000, 2002 and 2003. In addition, it will handle files in rich text format (rtf), Microsoft Works 6 and 7 (wps), Wordperfect 5 and 6 (wpd), HTML and XML. You don't need any version of Office or Word installed on the PC, but you do need Windows 2000 SP4, XP or Server 2003.

You'll find the tool if you search for 'Word Viewer 2003' at www.microsoft.com/downloads. It is free – though a fairly hefty 12MB download – and rather good. You get a similar File Open dialogue to that in Office, with the facility to add folders to the 'My Folders' placebar. You can search within documents and folders for documents containing specific text, although we couldn't get the latter to work. Another good feature is the Office 2003-style choice of views, including outline and the book-like 'Reading Layout' view (see screenshot 1).



Look but don't touch – the free Word viewer

Fruitless searching

The problem with searching for text in folders of files brings us back to the truly appalling file search facilities in Word 2003 (and other versions). Although the Task Pane is a marginal improvement, in that it retains the search results (something Microsoft lost for a while) it is still horribly clunky. If I want to search previous Word processing columns for a keyword or phrase, as I often do, it takes me eight clicks and a lot of scrolling to specify the relevant folder. The native Windows search has always been dreadful and the XP Indexing service is complex, clunky and only for the very brave.

So, having tried the Google Desktop Search engine, which is fast but all-encompassing so you can't pick folder locations, I decided to give the MSN Deskbar a try. The first impression was less than confidence-building as I got a message saying it was really designed for Windows XP or 2000 and might give 'unpredictable results' on my system – which was running XP.

Having ignored this, and carefully stepped through the minefield of installation options, I turned to the options. As with the XP Indexing Service and the Google Desktop Search, MSN Deskbar indexes your

files in order to speed up searches. Whereas it doesn't seem possible to specify folder locations on a per-search basis, I was able to limit its scope for indexing (and hence searching) by 'opting in' a handful of relevant folders. The Google offering requires you to 'opt out' folders and drives you don't want indexed, which can be a lot more trouble.

After giving it time to build up indexes on the Hands on folders, I tried a few back-to-back searches against Google Desktop, and was impressed. With the 'opt-in' approach the search produced more focused results, was faster than anything Microsoft has hitherto offered, and the results window has a snappy interface.

If Microsoft stripped out the rest of the MSN-related stuff such as Hotmail, Shopping, Tell a friend, Pop-up blocker, and let you specify and save target locations, and then incorporate just the local search engine into Word, we might at last have a usable document search feature in the program. There's a new version of Office due in 2006 – so will this happen? I wouldn't bet on it.

Readers' solutions

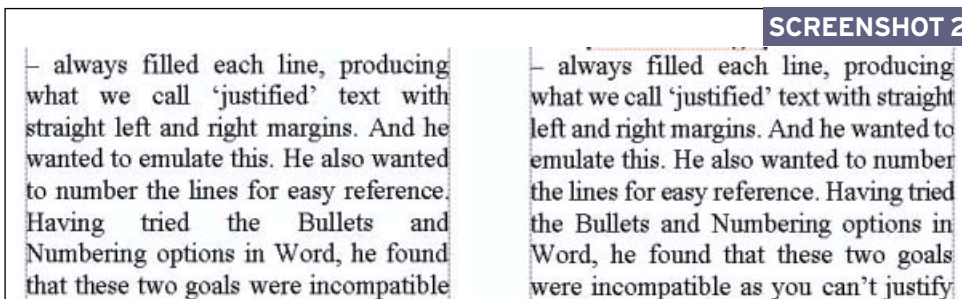
Further to April's comments on justified text and line numbering, Dennis Hartley wrote to tell us that you can improve on the quality of Word's justification if you go to Tools, Options, Compatibility and check the option to 'Do full justification like Wordperfect 6.x for Windows'. In screenshot 2 the option is ticked for the paragraph on the right and shows Dennis' observation is – er – justified. The Wordperfect method gives better text 'colour' with fewer stretched lines or 'rivers' of white space.

Going back further to the February column, Graeme Harris points out an easy way to stop Word 2003 adding every item of piecemeal formatting to the list box in the formatting toolbar. We covered one method last month, via the Task Pane, but there's another. Go to Tools, Options, Edit and untick 'Keep track of formatting'.

CONTACTS

Tim Nott welcomes your comments on the Word processing column. Email him at: wp@pcw.co.uk. Please do not send unsolicited file attachments.

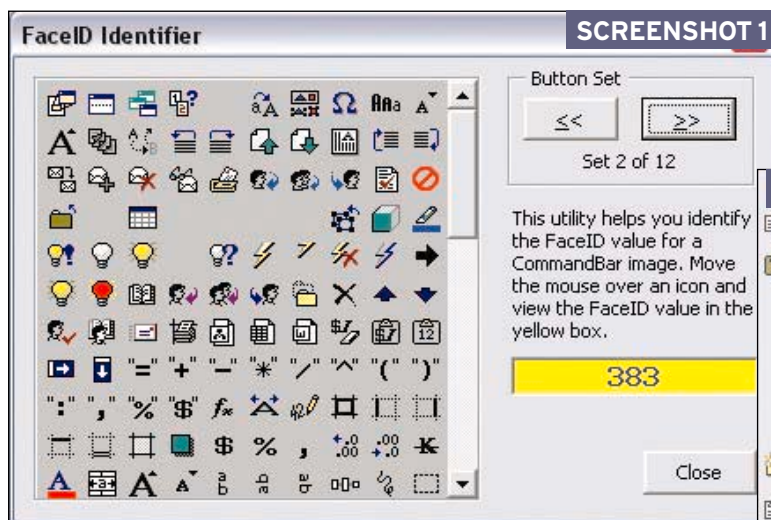
Justification – Word versus Wordperfect



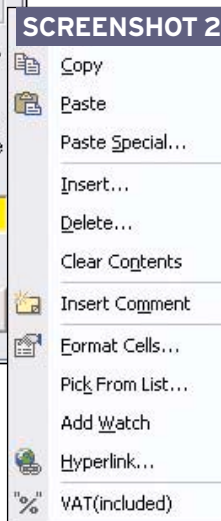


Value added macro for Excel

Writing a macro that adds VAT to cells is just one of the shortcuts that will save you time



Left: Finding the ID number for your icon



Adding an item to the shortcut menu

An Excel user has asked how to write a macro that adds VAT to a total in the cell above, and wants to run it from the main right-click shortcut menu.

This is quite easy to do, but first you need to be sure that you have the latest information on your applicable VAT rate and rounding rules. What is provided here is only an example. You should choose Options on the Excel Tools menu, then Macro Security, Security Level and then select Medium or Low. If you want to have an icon like the other icons on the shortcut menu you need to know its identification number.

One source of these icon face identification numbers is the small free add-in you can download from www.j-walk.com/ss/excel/tips/tip67.htm. Once installed and run, it offers a series of dialogue boxes (see screenshot 1). Hover the mouse over your chosen graphic and the box will display the correct ID number.

Now we can get started. Open a new workbook and press Alt & F11. On the Insert menu of the VBA for Excel editor select Module. In the right-hand window type the following:

```
Sub VAT()  
    ActiveCell.Formula <math>=MROUND(RC-1)</math>  
    ActiveCell.Offset(1, 0).Range("A1").Select  
End Sub
```

(Key: ✓ code string continues)

This macro enables you to click on any blank cell under a cell containing a net

amount and it will add 17.5 per cent VAT to display a gross amount.

Under this macro code enter:

```
Sub AddToShortMenu()  
With Application.  
    CommandBars("Cell")  
With .Controls  
With .Add(msoControl<math>=VB</math>  
Button)  
    .Caption = "VAT(included)"  
    .OnAction = "VAT"  
    .FaceId = 383  
End With  
End With  
End With  
End Sub
```

On your worksheet, you can now press Alt & F8, choose the new AddToShortMenu macro, and click the Run button. This makes the addition to your shortcut menu. The icon is a per cent sign.

Format the range you will be using for Number and two decimal places. Enter an amount in any cell say, 50. Right-click on the cell below and choose the new item, 'VAT(included)' (see screenshot 2). If all goes well that cell should now display 58.75.

If you make any mistakes in changing this menu or you want to make changes later, you need a way of removing this menu item. Simply add the following code below that already entered:

```
Sub DefaultMenu()  
    CommandBars("Cell").Reset  
End Sub
```

On the worksheet, press Alt & F8 again, choose the DefaultMenu macro and run that. Now your shortcut menu will be as it was.

Useful Excel shortcuts

Below, I have listed some of the more useful keyboard shortcuts in Excel.

To create a Name for a range from a heading, highlight the range, including the heading, and press Ctrl & Shift & F3. To check it has worked, click on the down arrow of the Name Box (on the left of the Formula Bar), choose your new Name – the range, excluding the heading, will be highlighted. If you want to paste onto a worksheet a list of the workbook's Names, with their ranges or formulas beside them, select the starting cell and press F3.

To open the Define Name box press Ctrl & F3. In the 'Names in workbook' type VAT. In the 'Refers to' box enter =17.5%. Click the Add button and then OK. Now if you enter, say 250, in cell C5 you can enter either =C5*VAT in the cell below to show the VAT amount, 43.75; or you can enter =C5+(C5*VAT) to display the new amount, including VAT – 293.75.

To instantly open the formatting dialogue box just press Ctrl & 1 (that's figure one on the top row, not the one in the numeric keypad).

Excel can put in a decimal point automatically for you when you're entering a lot of monetary amounts. You could enter 2345 in a cell and it will record and display 23.45. You can make your entries with either the numeric keypad (with the Number Lock on) or even using the numbers in the top row of a Microsoft keyboard. Just choose Options on the Tools menu, click the Edit tab and you'll find an option called 'Fixed decimal'. Don't forget to turn off this feature when you're done.

There are more menus in Excel than you may realise. Click on a cell with a date in it. If you left-click on the bottom right-hand corner and drag to the right, all you can do is add another day in each cell. But if you right-click, you can choose Series and then Weekday. Now when you drag to the right the Saturdays and Sundays will be omitted. If you choose Month, then the day and year stay the same, but the months increase.

CONTACTS

Stephen Wells welcomes your comments on the Spreadsheets column. Email him at: spreadsheets@pcw.co.uk. Please do not send unsolicited file attachments.

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TEAM LING - LIVE, INFORMATIVE, NON-COST AND GENUINE!

Niall Magennis has been dabbling in Midi and digital audio since the days of the Atari ST. He writes on a freelance basis for a number of music magazines and lives in London in a flat overrun with music equipment



Make the most of Windows Media Player

Customise your settings, synch with other players and control your playlists

The early versions of Windows Media Player weren't always very user friendly. Over time, however, the software has been pulled apart and put back together by Microsoft and, with each rebuild, has become more palatable and, crucially, more useful.

Microsoft really turned the corner with version 7, the one that shipped with Windows ME, when it added a proper media library, CD ripping capabilities, support for Internet radio stations and a web-based media guide, among other features. With the current offering, version 10, Microsoft has tweaked the user interface to make it more consistent and less confusing.

It may still be far from the perfect media player, but at least Microsoft is improving the product. So this month we're going to take a look at Windows Media Player 10 and give you some tips and tricks on how to get the most from it.

For years, Microsoft tried to avoid offering mp3 encoding as part of Windows Media Player (WMP) because it wanted to push its own compression format – Windows Media Audio (wma). One of the big changes with WMP 10 is that it has finally relented and included an mp3 encoder as part of the software.

However, by default, WMP is still set to rip CDs into wma format. To change this, you first need to click on the Tools menu and then select Options from the list. In the window that appears, click on the Rip Music tab and you'll see a box in the bottom half of the window showing wma as the currently selected format. To change the format, click on this dropdown box and select mp3 from the list (see screenshot 1).

By default, the mp3 encoding rate is set to 128Kbits/sec, which produces fairly good audio quality, but we find that a bit rate of 192Kbits/sec produces a significant improvement in sound quality for not that much extra outlay in terms of storage space. Once you're finished changing the settings, you can click OK to have them stored. Now, when you rip music it will be encoded directly into mp3 format.

If, on the other hand, you do decide to stick with the wma file format we'd advise you to make sure that the Copy Protect Music box displayed on the Rip Music tab is



unticked. If you rip your music with copy protection enabled you won't be able to easily transfer it between devices and other computers. Also, if your install of Windows becomes corrupt you may find yourself unable to play any of the music you have ripped into wma when you restore the operating system. In fact, we'd advise you not to rip a CD with the wma copy protection turned on as it can lead to a host of these kinds of problems at a later stage.

If you're planning on ripping lots of CDs say, for example, if you're converting all your CDs to mp3 format to put them on a portable hard disk music player, then there are a couple of very useful settings in WMP 10 that you can turn on to speed up the process.

These settings allow you to configure WMP 10 to automatically rip CDs to mp3 or wma as soon as they are inserted into your PC's CD or DVD drive and then eject the CD when the ripping process has finished.

To set up WMP 10 in this way, first click on the Tools menu and then select Options. Now click on the Rip

Music tab again and this time tick the boxes for 'Rip CD when Inserted' and 'Eject CD when Ripping is Complete'. To apply the settings, click on the OK button (see screenshot 2).

Synching

Microsoft has also improved the way that WMP works with portable audio players. Now, if you have WMP running with some songs selected in your Sync List and plug in a portable music player, the software will recognise that you've added a new device and automatically ask you whether you want to sync with it.

The implementation is a bit clunky, because any time you plug a removable storage device into your PC while there are items in your Sync List, you'll be asked if you want to sync with it, even if the device is not a music player. There is a way around this if the device always appears as the same drive letter – for example, if it happens when you plug an SD card into a slot in a memory card reader that's built into your PC. To stop WMP from asking you whether you want to sync with the device, you need to go to the Tools menu and select Options from the List. Then, in the window that appears, click on the Devices tab, select the drive letter for your card reader and then click on the Properties button. All you have to do is untick the Box marked 'Start Sync When Device Connects' and click on the OK button. Now, when you put your card in the slot, WMP will ignore it (see screenshot 3).

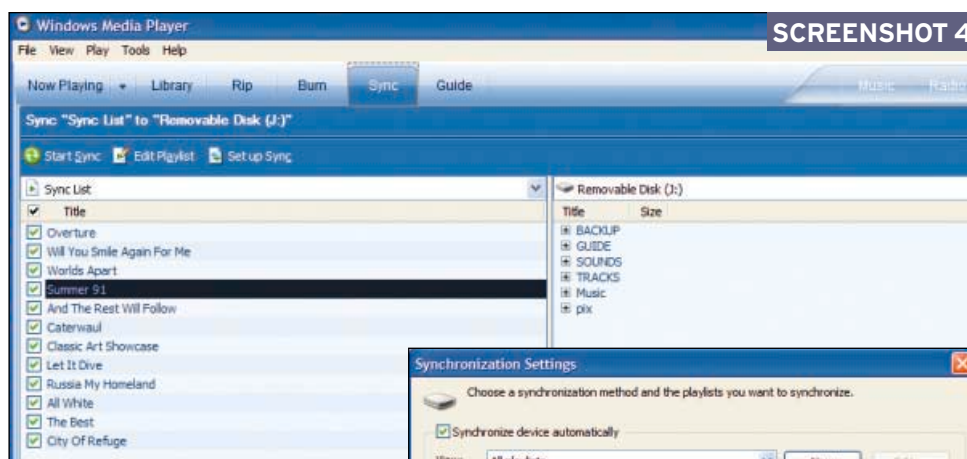
Of course, if you do have a portable music device, this new Sync feature

Above: WMP now has built-in support for ripping CDs to mp3 format

Left: You can set up WMP to automatically rip CDs when you insert them into your drive

You can stop WMP from automatically trying to sync with your device when you plug it into your PC





WMP 10 makes it much easier to transfer songs to a portable player

makes it easy to select a list of songs and transfer them to your player without having to load up a third-party application. To try it out, click on the Library tab in the main WMP screen and right-click on a song you want to transfer to your device. In the pop-up menu that appears, select Add To and then Sync List. You can also select multiple songs by holding down the Ctrl key and clicking on them. Then right-click on any of the highlighted songs and choose Add To and Sync List to select those songs for transfer.

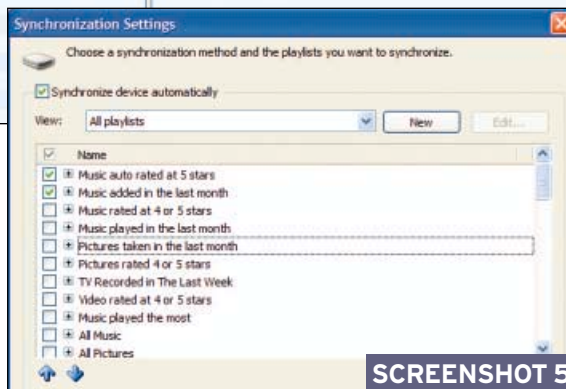
When you have your selection songs in your Sync List, click on the Sync tab in the main WMP screen. The list of songs you have selected will be shown in the left-hand panel. If your portable player is not already shown in the right-hand panel, click on the down arrow and select the device name or drive letter from the list. Now, click on the Start Sync button and your files will be transferred (see screenshot 4).

However, if you first create your sync list and then connect your device, WMP will ask you to set up the sync options for your player. There are two options: Manual and Automatic. If you select Manual you will have to manually select the tracks that you want to transfer to the device each time you connect it to your PC.

Alternatively, if you choose Automatic, WMP will try and sync your entire music library to the device every time you connect it to your PC, if it will fit. If the music library won't fit on the device it will decide which files to transfer to your player, based on the playlists held within WMP 10.

Control the playlist

If you want to control which playlists are used for automatic synchronisation, tick the box marked

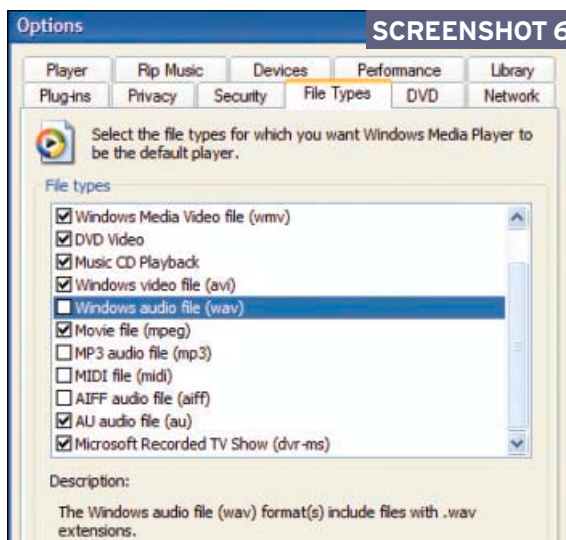


You can choose the playlists that WMP uses to automatically sync with portable devices

'Customize The Playlists That Will Be Synchronised'. You'll be presented with a list of all the playlists that are currently stored in WMP. You can now tick the boxes for the ones that you want to use for synchronisation. The playlists will be synchronised in the order they appear in this window. If you want to increase the priority of a playlist, highlight it in the window and use the arrow button at the bottom of the screen to move it towards the top of the window. When you're done, click Finish. WMP will now start synchronising music with your device (see screenshot 5).

You can quickly re-associate audio file types with WMP using the File Types tab

If you want to change the priority of the playlists at a later date, all you have to do is click on the Library tab in the main WMP interface and then, in the left-hand panel, right-click on



the entry for your music player. From the pop-up menu, select Change Sync Settings and you'll be able to change the order of the playlists again.

When you install other media players on your PC they often have an annoying habit of taking over your media file associations. The result is that when you double-click on a music file it is played by the new media player rather than by WMP.

You can change the file associations for individual file types in Windows Explorer by right-clicking on the file and selecting Open With from the menu. You then choose WMP and tick the box marked 'Always Use The Selected Program'. However, if lots of different file associations have been changed, it can be tedious to change them all back in this way. A quicker way of doing it is to open WMP and click on the Tools menu and select Options. In the window that appears, select File Types and then tick the boxes for the files that you want to associate with WMP again, or just click on the Select All button to set WMP as the default player for all the file types it supports. When you're done, click on the OK button and the files will be re-associated with WMP again (see screenshot 6).

Also, don't forget that like many other applications, WMP supports keyboard shortcuts. So if you don't have a keyboard with multimedia buttons you can still control the player with key combinations. To play or pause a track, press Ctrl & P and to stop playback press Ctrl & S. If you want to increase the volume press F10, to reduce it press F9 and to mute it press F8. You can skip back a song by pressing Ctrl & B and skip forward by pressing Ctrl & F. Pressing Ctrl & Shift & B will rewind a track and Ctrl & Shift & F will fast forward.

These are only some of the keyboard shortcuts that WMP reacts to. To see a full list, open the WMP help file and search for 'keyboard'. There are shortcuts for ripping and burning CDs, controlling the media library, choosing skins and lots more.

Hopefully, using some of these tips you'll be able to customise WMP to your needs. Remember also that WMP can be expanded using plug-ins, so check out www.wmplugins.com if there's a feature that you need, but isn't included in the main application.

CONTACTS

Hands on Sound will return in the August issue. Niall Magennis welcomes your comments on the Sound column. Email him at: sound@pcw.co.uk. Please do not send unsolicited file attachments.



Unravelling IP address mysteries

Master the basics of connecting your networked PCs to the Internet

Apologies to anyone expecting more on Voice over IP (VoIP), as promised last month. I will be covering the topic in more detail in future issues, but for now I want to re-visit a few networking fundamentals, both to prepare the ground for those future columns and to help resolve some of the more basic networking queries I've received.

First, here's a short re-cap on IP addresses and how they're assigned. It's something most networking professionals take for granted, but can be a bit of mystery if you're a network novice.

Addressing the problem

Every device attached to your network needs to have its own unique IP address, be it a PC, server, router or whatever. These addresses are 32bits long and are typically expressed using four decimal numbers between 0 and 255, separated by full stops.

So, for example, the IP address of the PC I'm writing this article on is 192.168.1.24, while the router I use to connect to the Internet has an address of 192.168.1.1.

If you want, you can set those addresses manually. Indeed, my router has to be configured this way, as it's important that its address never changes, otherwise the PCs and other devices on my network wouldn't be able to find the router and use it to connect to the Internet.

However, that's not a problem for ordinary PCs on the Lan – it makes life a lot easier if I opt to use the Dynamic Host Configuration Protocol (DHCP) to assign addresses, rather than configure each one manually. More than that, duplicate addresses are avoided by using DHCP. Plus, if you're using a mobile device, such as a wireless notebook or PDA, you can connect to different networks without having to reconfigure IP address settings every time.

In fact, most home and small-business routers now come with a built-in DHCP server, to assign IP addresses automatically to any attached network device. What's more, the DHCP server is usually turned on by default, so all you have to do is tell each PC and printer on your Lan to use DHCP, plug it in and go. That process is made even simpler



in Windows 2000 and XP, where the default setting for a new network connection is to get an IP address automatically (see screenshot 1).

Unfortunately, things can still go wrong, even when using DHCP. For instance, problems can arise if you have more than one DHCP server on the Lan. Some wireless access points, for example, have a built-in DHCP server, along with many firewalls, VPN servers and storage appliances. Windows and Linux file servers can also come equipped with DHCP servers, so if you install any of these and already have a working DHCP server make sure you turn off all but one of them. Additionally, you may

DHCP servers able to dynamically assign client IP addresses are built into most broadband routers and firewalls like this one from Sonicwall

want to control the addresses your DHCP server issues. Not all implementations let you do this, but basic controls over the range of addresses that can be assigned are quite common and worth having, if only to separate dynamically assigned addresses from those that have to be fixed and constant, such as the address of your Internet router, or a local intranet, FTP or mail server.

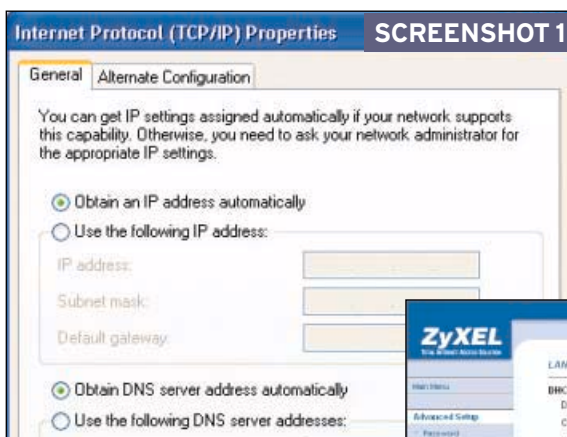
Other uses

As well as the main IP address, DHCP can also be used to set the default gateway address and the addresses of DNSs (domain name servers) to use for network name resolution. The DHCP servers on most Internet routers will be configured to do this automatically, but with other implementations you may have to configure the other addresses manually. How you do that depends on the DHCP server, but it's usually just a matter of filling in a few boxes in the management interface, as in screenshot 2.

Exactly what addresses you need to supply will also vary. The gateway address is easy enough to establish (it's usually the address of your Internet router), but DNS can cause problems. If you've installed your own DNS, then configure the DHCP server to specify the address of that host for DNS. Otherwise, use the DNS addresses provided by your ISP, or simply put in the address of the default gateway, as most Internet routers include a basic DNS as standard too.

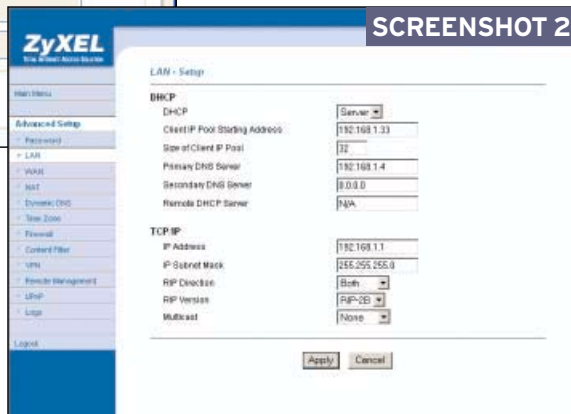
Checking addresses

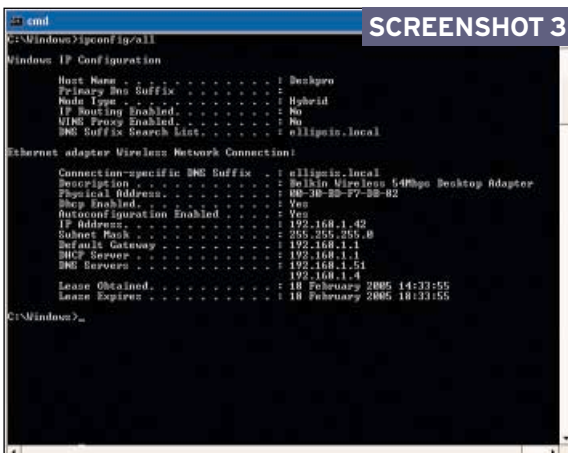
Most of the time, DHCP works fine, but there can be times when things go wrong. The DHCP server might crash,



Above: The default setting in Windows 2000 or XP is to obtain an IP address automatically using DHCP

Right: Most DHCP servers let you set the range of addresses to be dynamically assigned so you can avoid conflicts, as in this Zyxel router





SCREENSHOT 3

for example, or lose its network connection. Troubleshooting such problems isn't always easy, but checking whether a client PC has been assigned an address is.

On Windows 2000/XP machines, simply open a command window and type the command ipconfig /all to get a list of the currently assigned IP addresses (see screenshot 3). Alternatively, with older Windows 95/98 systems, you can run a utility called winipcfg to do the same from a graphical console, while for Linux the command is ifconfig. Super-user rights are required and you can type 'ifconfig--help' to get a list of options.

If no address is shown, the DHCP server is either down or inaccessible, perhaps because you're connecting to a wireless network and haven't provided the right encryption key. On later versions of Windows you may see an address in the format 169.xxx.xxx.xxx rather than all zeroes. This is generated by the client itself and means that contact with the DHCP server couldn't be established.

You can use the ipconfig command to refresh your IP address, which is something you might need to do if the DHCP server wasn't accessible when the PC was booted, or if you make a change to addresses controlled by the server. To do this, type ipconfig /renew to force the DHCP client to request a new address.

Dynamic Internet address

Service providers use a similar mechanism to DHCP when assigning a public IP address to your Internet modem or router, which is fine most of the time, but not always. For instance, when you want to host your own email server or connect to your network remotely over a VPN (virtual private network), you'll need a fixed public IP address as a variable one could, potentially, result in non-delivery of mail, and VPN

On a Windows PC use the ipconfig command to view and manage dynamically assigned IP addresses

Port forwarding allows remote access to multiple NAT-protected servers via a single public IP address, as on this Intertex IX66 router

clients that can't connect to their host server.

One way round this problem is to use a dynamic DNS service where your public IP address is monitored and DNS updated whenever it changes. However, you need a router that supports dynamic DNS for this to work seamlessly. Also, there are plenty of service providers willing to provide fixed IP addresses for little or no money, making switching from a dynamic to fixed address an option for those who do need to run servers.

The same but different

Lastly, I want to touch on the subject of network address translation (NAT). I mentioned earlier that IP addresses needed to be unique, but that's not absolutely true – they only have to be unique in the context of the network they're used on.

The address of my router for example (192.168.1.1) is the same as that of thousands of others around the world and, similarly, there are lots of other PCs with the same 192.168.1.24 address. However, that's all right because none of these is directly connected to any other. Of course, they could be – when my Lan is connected to the Internet – but I do that using a shared Internet gateway, which hides all my local addresses using NAT. In fact, the range of addresses beginning 192.168 (together with the 10. range) is specifically set aside for use on private networks in this way.

To handle this, the gateway (which could be a specialised PC or appliance as well as a dedicated router) will typically have two network interfaces – one attached to the Lan and the other to the Wan (ie the Internet). The Wan interface is assigned a unique public IP address, the gateway translating the Lan addresses to that of the Wan port and back again as data packets pass in and out. The big plus with NAT is that there's no need to allocate unique

public IP addresses to every bit of kit on a network. It also allows the Internet to function using 32bit IP addresses, even though there really aren't enough numbers to go round and also provides some protection against hackers and other intruders who never get to 'see' the addresses of anything on your Lan.

On the downside, NAT isn't by itself a complete firewall and it can cause problems when you want to allow remote access to a server or other device located inside the gateway.

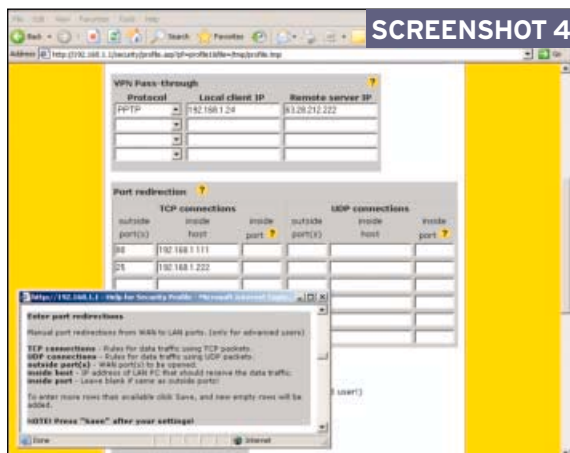
Let's say, for example, that you configure a local web server with an address of 192.168.1.100. Users on the Lan will be able to connect to it using this address, but others on the Internet won't, as your network has a totally different public IP address when accessed remotely via the Internet gateway. And it's the same if you configure a VPN server on the Lan. It simply won't be visible remotely if the Internet gateway has NAT turned on.

That doesn't mean that you should abandon NAT and turn it off in such cases, as there are ways around the problem. Some routers and firewalls, for example, have so-called DMZ (Demilitarised Zone) interfaces, which can be used to connect things like web, email and VPN servers to the Internet directly. The rest of the network is still NAT-protected, while servers in the DMZ can be assigned their own public IP addresses.

The good thing here is that the DMZ can still be protected by the firewall, but not all routers/firewalls have this option and you will need additional public IP addresses, for which there might be a charge made by your ISP.

As an alternative, it's worth checking to see if your router or firewall supports port mapping as this enables multiple servers to be made available using just one public IP address (see screenshot 4). All that's needed is to tell the router/firewall to look for traffic on a particular port and direct it to a specific internal IP address. For example, HTTP packets can be sent to your web server by forwarding everything on port 80, SMTP traffic on port 25 forwarded to the mail server and so on.

Unfortunately, other problems can arise from the use of NAT, especially if you want to deploy VoIP. But that's a topic for another time.



SCREENSHOT 4

CONTACTS

Alan Stevens welcomes your comments on the Networks column. Email him at: networks@pcw.co.uk. Please do not send unsolicited file attachments.

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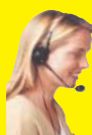
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Mark Whitehorn
is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars



A moving data story

Transferring entries from one database to another isn't always simple, but we can help

Last month I described a reader's need to move data for his nursery – all 1,200 rows – from a hand-built Access database into a newly acquired proprietary database, also based on Access. Both databases contain much the same basic information, but there are more fields in the new one. For example, data about whether the plants are annuals or like dry conditions is held in a set of Yes/No fields.

A lack of success was associated with my first attempt to help out: cutting and pasting data from a copy of the old database into a copy of the new database met with failure. The problem was obviously more complex than I initially thought.

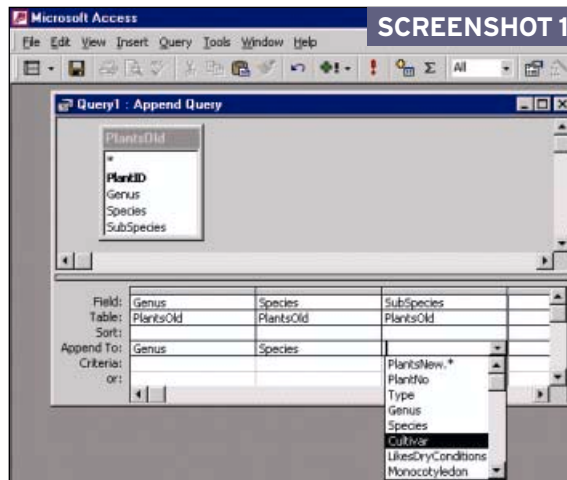
That's the stage described in last month's column, though I'd mapped out a general six-step plan for moving data between databases: getting the data out of application one; getting it into application two; changing the format of the old data; changing the 'shape' of the old data; supplying any new default values to the old data and appending the old data to the new.

Further investigation into why my first attempt failed revealed that the problem lay in the distinction between the application and the tables that underlay it in the database.

When the application is used to create new plant records, it supplies default values for all the Yes/No fields. When I cut and pasted records into the underlying table, the application was being bypassed, so it never got the chance to supply the default values. The result was that all the Yes/No fields contained null values and it turned out that it was these null values that were causing the odd behaviour of the application.

We restored from the backup and started again. We used the interface of the new application to create a new entry and then looked at that entry in the plant table. That told us the defaults that the application was supplying for the Yes/No fields. As a test, we cut and pasted a record between the old and the new, and then hand-inserted the default values that the interface would have inserted. That worked like a charm.

We could hand edit all 1,200 records or, during the pasting process, we could get the old records into the right 'shape' for the new table.



Creating the query to move data from one table to another

To demonstrate this, there is an mdb (DBC\June05.mdb) if you've bought the DVD edition of PCW.

In this file are two tables: PlantsOld is a simplified version of the original plant table and PlantsNew represents the new database and has a table with a more complex structure. As you can see, the mdb already contains both old and new tables, which means we have already completed steps one and two. In order to get to this stage you would do the following: open the destination database, select File, Get External Data, Import. Navigate to the source database, select the table you want to copy, click OK and it should appear in the destination database.

These two steps are easy here because we are using Access in both cases. Had that not been the case, I'd probably have exported the table from the old database as a csv (comma separated values) file or as XML and then imported that into the new database.

As for step three, in Access the simplest way to convert data format (say, numeric to text) is to try changing the data type in design mode. Some conversions work well (numeric to text), others work badly (text to numbers). In this case, the source and destination fields were of the same data type – text – which means we can move to the last three steps. By using Access (or any relational

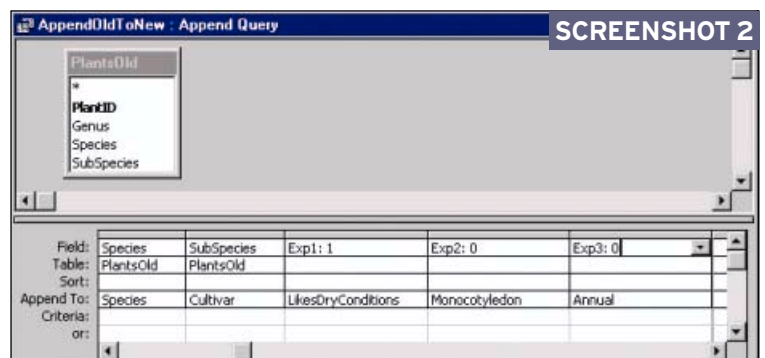
database) all these can be performed in a single manoeuvre, using an Append query. First, we'll look at using Access to build the query, then at the SQL which, with a little modification, should run in most relational databases.

Open a new query design window and add the PlantsOld table – an Append query appends data to an existing table so it would be more accurate to call it an Append To query, which would also make it clearer that you start work with the source table. Add the Genus, Species and Sub-Species fields to the query grid. We won't add the PlantID primary key field – it's an AutoNumber field, as is the PlantID field in the PlantsNew table, so it is highly likely that both fields will contain the same values. The appended records will be given unique ID numbers automatically during the Append operation, so integrity of the primary key data will be upheld.

Now select the Append option from the Query Type button and specify the PlantsNew table in the current database. The Append To line of the query grid will match the Genus and Species fields to fields of the same name in the destination table, but not for Sub-Species because there is no field of this name in PlantsNew. In the Append To cell in the Sub-Species column, pop down the list of available fields and select Cultivar, this being (more or less) the same as Sub-Species in the botanical world (see screenshot 1).

Now you need to generate default data for the Yes/No fields that exist only in the new table. Click in the Append To row of an empty column and select the first of these: LikesDryConditions. Yes/No fields require either a zero (wherever we want a No to appear) or a one

Here is the complete query





▶ **Table 1 Component**

ComponentID	Name
1	Gen Bracket
2	Font Clip
3	Pel. Grommet Stand

(wherever we want a Yes) so we have to feed the field with one of these acceptable values. The default to choose would depend on your data: if you worked at the Desert Botanical Garden in Phoenix, Arizona, you'd probably want a 1 (Yes) default. Exceptions to the default will have to be added by hand once the records are available to the new application.

We supply the default value by building an expression. In the Field row of the LikesDryConditions column, type:

Exp1: 1

The Exp1: bit gives the expression a unique name. The 1 after the colon tells the expression to insert the value we want (in this case a 1) into the LikesDryConditions field.

Build similar expressions for the Monocotyledon and Annual fields, feeding these a default of zero (see screenshot 2), remembering to give each a unique name.

The SQL that does all this reads:

```
INSERT INTO PlantsNew (
Genus, Species, Cultivar,
LikesDryConditions,
Monocotyledon, Annual )
SELECT PlantsOld.Genus,
PlantsOld.Species,
PlantsOld.SubSpecies, 1
AS Exp1, 0 AS Exp2, 0 AS
Exp3
FROM PlantsOld;
```

(Key: ✓ code string continues)

Inspect the action of the query by clicking the View button and, if all looks in order, Run the query. (In the mdb I have supplied, the query AppendOldToNew is in place, but has not yet been run). PlantsNew now contains all the records from PlantsOld, with default values for the three Yes/No fields. When we tested this with the new application we found that it digested these with perfect equanimity. This saved the tedious job of hand-entering 1,200 plants, although some hand editing of the Yes/No fields was still needed.

Turn reports around

In the February column I described a problem and provided a solution as an mdb, but neglected to explain how it worked. Several people have emailed about this. I must apologise; here is the explanation.

Most reports are based on a single table (or query) and most use

Table 2 Casting

CastingID	ComponentID	Description	Process
1	1	Mild Steel	Red hot
2	1	Iron	Quenching in Oil
3	1	Iron	Reheat
4	2	Mild Steel	Red Hot

Table 3 ReportHolder

Name	Header	Process	Description
Gen Bracket	Casting	Red hot	Mild Steel
Gen Bracket	Casting	Quenching in Oil	Iron
Gen Bracket	Casting	Reheat	Iron
Font Clip	Casting	Red Hot	Mild Steel
Gen Bracket	Milling	Mill Down	2mm
Font Clip	Milling	Mill Up	4mm
Font Clip	Milling	Grind	0.5mm
Gen Bracket	Painting	Apply Hot	WaxOil
Pel. Grommet Stand	Painting	Cold Spray	Penguin Black
Pel. Grommet Stand	Painting	Cold Spray	Penguin White
Pel. Grommet Stand	Painting	Water Based	Penguin Yellow

grouping to organise the information. This is fine until we are required to produce a report that lists information from several tables in the same column in the report.

Suppose we store information about the different engineering processes (casting, milling and painting) that are applied to components that are manufactured. A single component can have any number of each of these processes applied. So, for example, a particular component might have one casting process, no milling processes, but seven painting processes. We would store this information in a four-table database.

The first table stores information about each component (see table 1).

Then we have a table called, say, Casting. This stores the ID of every product that is cast, together with details about the different casting processes applied (see table 2). We have two other tables, one

This is the report we want, but how do we generate it?

SCREENSHOT 3

Name	Header	Process	Description
Font Clip	Casting	Red Hot	Mild Steel
	Milling	Grind	0.5mm
	Milling	Mill Up	4mm
Gen Bracket	Casting	Reheat	Iron
	Casting	Quenching in Oil	Iron
	Casting	Red Hot	Mild Steel
Pel. Grommet Stand	Milling	Mill Down	2mm
	Painting	Apply Hot	WaxOil
	Painting	Water Based	Penguin Yellow
		Cold Spray	Penguin White
		Cold Spray	Penguin Black

for milling and the other for painting. Our reporting problem is that, although we use three different tables to store the information about processes, in the report we want all information from the three different tables to appear under one heading. In other words, we want a report that looks like screenshot 3. Note that here we are collecting three different processes and putting them effectively into the same group.

One solution (there are others) is to create a new table called ReportHolder and insert into it the data from the three process tables. The point of doing this is that it enables you to create a single column in ReportHolder (Process) that contains information from the three different processes. We can also add other columns as required (see table 3).

Given the data in this format, it is a simple matter to write the report that we need. So the question is, how do we generate the ReportHolder table?

There are three queries in the sample mdb. The first is a make table query called CastingFeed.

```
SELECT Component.Name,
"Casting" AS Header,
Casting.Process,
Casting.Description INTO
ReportHolder
FROM Component INNER JOIN
Casting ON
Component.ComponentID =
Casting.ComponentID;
```

If the table ReportHolder exists, this query blows it away, creates it afresh and inserts the casting data into it (the first four rows of table 3).

Next is an append query called MillingFeed.

```
INSERT INTO ReportHolder
( Name, Process,
Description, Header )
SELECT Component.Name,
Milling.Process,
Milling.Description,
"Milling" AS Header
FROM Component INNER JOIN
Milling ON
Component.ComponentID =
Milling.ComponentID;
```

This doesn't blow away ReportHolder, instead it simply inserts the appropriate rows from the Milling table. A third query inserts the third set of data and the report is ready to rock and roll.

CONTACTS

Mark Whitehorn welcomes your comments on the Databases column. Email him at: database@pcw.co.uk. Please do not send unsolicited file attachments.

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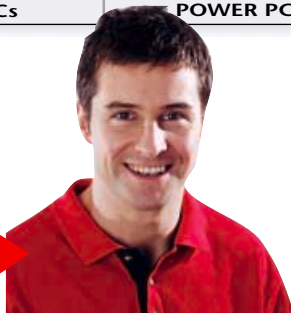
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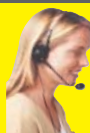
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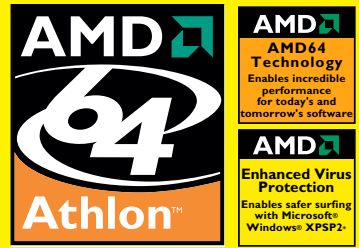
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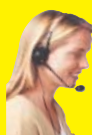
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Take it to the limit

How to support limited users in your apps and get Windows XP themes in Visual Basic 6

Everyone knows Windows has to become more secure, but it is not only Microsoft's responsibility. A large part of the problem is that most users effectively disable a huge chunk of the security built into Windows NT, 2000 and XP, by running with administrator rights for everyday work.

Users should have the minimum rights that they need. This will make a big difference, since malware typically runs with the same rights as the logged-on user. If the user has read-only permission to system folders, application folders and most of the Registry, then the malware can only do limited damage. Good security practice is worth more than fix-up utilities like anti-virus software.

This means users can run more securely by removing themselves from the Windows Administrators or Power Users group, remaining only in the Users group, called a Restricted user in Windows XP.

In XP Home, you can use the Limited account type. However, in practice, many Windows users run with local administrator rights. Microsoft has done too little to promote the idea that limited user rights are the norm and there are plenty of applications that do not run correctly in this scenario.

An amusing example is the clock and date applet in the system tray. If you double-click this as a limited user, you get a message: 'You do not have the proper privilege level to change the system time.' The reason is that changing the system time requires at least Power User rights. The bug is not in the restriction, but in the way it is handled. A well-behaved application would let you view the date and time zone even though you cannot change it or better still prompt for an administrator password when needed.

The truth is that users will only log on without administrator rights when their applications run properly. That is why this is a key topic for programmers. There is a direct link between developers making wrong assumptions about user permissions, and Windows machines getting infected with spyware and worse. It is wrong to think this is only an issue for commercial software companies. In reality, it is just as important if you are creating applications for personal



use or for internal business users. So what does it take to write an application that behaves well for limited users? It is normal for installation to require administrative rights, but, once installed, the key point is where the application writes data. Writing to the application folder is out, because it will be read-only, unless you install it somewhere in the user's home directory, such as in My Documents. Writing to the HKEY_LOCAL_MACHINE section of the Registry is also impossible.

Instead, the application must use system-defined locations that are designed to be writeable. If you use a file-sharing database like Access, the same applies to any database files you need to update. Using a client-server database like SQL Server is easier, since the actual files are written by a different process with its own permissions. In this case, all you need to manage is the database log-in.

First, you must identify the correct locations. In a .Net Framework application, you can use the System.Environment.GetFolderPath method, passing it one of around 20 values. Some of the key ones are:

- Personal: Returns My Documents folder
- ApplicationData: Returns user-specific location for application data.
- CommonApplicationData: Returns a common location for application data. This will be the same for all users on the machine.
- ProgramFiles: Returns the location of the program files tree.

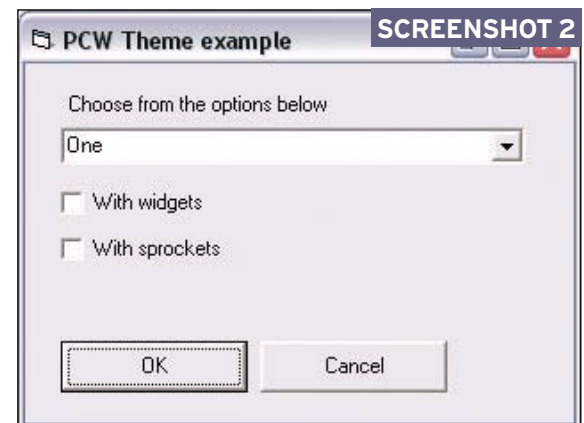
In addition, you can retrieve the location of folders like My Music. If you are not using .Net, the

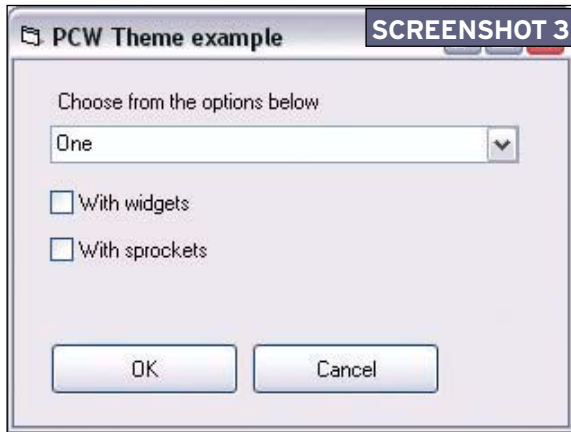
Errors like these are typical when running as a standard user with applications that assume administrator rights

SHGetSpecialFolderPath API function does the same job. These locations force you to decide which parts of your application data should be user-specific and which should be common to all users. A complication is that users will want to be able to back up their data and some of these locations are hidden, another mis-step by Microsoft. For example, the Application Data folder is normally in Documents and Settings\username\Application Data and this folder is hidden by default in Windows Explorer. You might want to build a backup routine into the application, or at least display the paths in a dialogue so that users can find their data.

Another tip is to avoid writing user data during installation where possible. Such files will be installed by the administrator and by default will be read-only for standard users, even if they go in writeable locations. It is better to have the application create such files at runtime. However, something as seemingly simple as an

By default, VB 6 applications still mostly look like Windows 95





Access mdb designed to be shared by all users can be problematic. If it is written by the installer, it will be read-only by default.

The answer is for the installer to create the file, and to set its permissions to read-write for all users. The next thing you discover is that changing a file's ACLs (access control lists) in code is not straightforward. The Windows security API is complex, particularly since the order of the ACLs can be critical. The setup projects in Visual Studio .Net 2003 do not provide an easy way to edit file permissions and the .Net Framework 1.1 does not wrap the security API, although this is available in the forthcoming .Net Framework 2. There is support for setting file permissions in the Windows Installer, but Visual Studio 2003 developers have to edit the generated MSI (Microsoft Installer) file with another utility or use a third-party setup application.

Another idea is to shell out to a script, such as CACLS, a command-line utility that is installed as part of Windows. It's worth noting that Windows ME, 98 and earlier do not support file-based security. Developers need to detect Windows 98 and bypass security-related code, while users have to consider whether it is wise to use such an insecure OS.

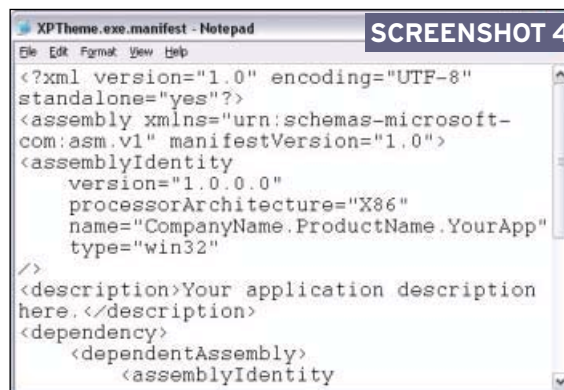
Developers have to bear some responsibility for the parlous state of Windows on many desktops and must ensure that new applications behave properly. In most cases that is straightforward, provided you use system-defined locations for writing data. In some cases, it is awkward, but critically important.

XP themes with VB 6

David Burgess asks: 'I have written a few small applications with Visual Basic 6 and now that I've started using Windows XP, I was wondering how I could get the XP style of buttons to appear. Are there add-ons

Adding theme support makes controls look right, but needs careful coding and testing

This manifest looks complex, but the standard example copied as-is will be sufficient to support themes, provided it has the right name



Online resources

There is a fascinating Microsoft paper on why applications fail with limited rights:

<ftp://ftp.research.microsoft.com/pub/tr/TR-2005-15.doc>

Microsoft's knowledgebase article on VB6 and themes:

<http://support.microsoft.com/?kbid=309366>

Innovasys freeware controls with theme support:

www.innovasys.com/products/freeware.asp

to VB 6, or do I need VB.Net?' You can support Windows XP themes in Visual Basic 6, but it is officially unsupported. XP themes are customised visual designs that you can apply through the display applet Control Panel. For example, a Windows XP button has a rounded appearance, uses gradient colours and changes to indicate selection when the mouse passes over it. By contrast, VB 6 buttons look pretty much as they were in Windows 95.

The reason is that Windows XP has two versions of the Common Control library (ComCtl32.dll). Version 5 is the old one and is used by default for compatibility reasons. Version 6 is specific to Windows XP and supports themes. This only applies to the client area of your forms and windows – the surrounding frame always has theme support. In some ways this is unfortunate, since if the user applies something like the Silver colour scheme in XP, lack of theme support leads to an inconsistency between your buttons and controls and the surrounding window frame.

The solution is to have your application use the version 6 common controls. To do this, first you need to add a manifest. This is an XML file conforming to a specific schema and there are plenty of examples that you can copy and paste from Microsoft's documentation on the web, such as the knowledgebase article (see boxout). The manifest must be called yourapp.exe.manifest, where yourapp is the name of your

application, and it has to be in the same location as the application itself. Second, you need to initialise theme support by calling the function `InitCommonControls`, declared like this:

```
Private Declare Sub  
InitCommonControls Lib  
"comctl32.dll" ()
```

(Key: ✓ code string continues)

You must call this before displaying any forms. Microsoft suggests putting the initialise event handler in your main form or you could do it as the first thing in `Sub Main`. You will find it has no effect when you run in the VB 6 IDE, but when you execute the compiled application, its appearance will change.

Unfortunately, it is not that simple and some things may not work as expected. In particular, the VB 6 frame control breaks when themes are enabled. The fix for this is to install the Innovasys freeware controls, which include a `Frameplus` control that does not suffer from this problem. Even then, you will need to test carefully, as there may be other native or third-party components that show strange behaviour.

The general problem is wider than VB 6. Even in VB.Net, which is designed to support themes, they add complexity to the development process. Many developers use custom drawing to create advanced controls. With the standard appearance, you can match the appearance of standard items, provided that you use system-defined colours. If themes are active, you need to go further and call the API functions in `uxTheme.dll`, such as `DrawThemeBackground`. To make matters worse, some of the official .Net controls do not properly support themes. There are work-arounds, but it is odd that Microsoft did not make theme support easier. It looks much better in Visual Studio 2005.

CONTACTS

Tim Anderson welcomes your comments on the Visual programming column. Email him at: visual@pcw.co.uk. Please do not send unsolicited file attachments.



```
C:\Documents and Settings\ktaylor.UNUBPL>time /t date /t
15:47

C:\Documents and Settings\ktaylor.UNUBPL>time /t & date /t
15:47
07/03/2005

C:\Documents and Settings\ktaylor.UNUBPL>fsutil fsinfo ntfsinfo c:
NTFS Volume Serial Number : 0x2658b0e358b0b343
Version : 3.1
Number Sectors : 0x000000000043d334b
Total Clusters : 0x000000000043d334b
Free Clusters : 0x000000000056be8a
Total Reserved : 0x0000000000000f90
Bytes Per Sector : 512
Bytes Per Cluster : 512
Bytes Per FileRecord Segment : 1024
Clusters Per FileRecord Segment : 2
Mft Valid Data Length : 0x00000000c2d4000
Mft Start Lcn : 0x0000000000152e3c
Mft2 Start Lcn : 0x000000000021e99a5
Mft Zone Start : 0x00000000002986d40
Mft Zone End : 0x0000000000298ed40

C:\Documents and Settings\ktaylor.UNUBPL>_
```

SCREENSHOT 3

pathping www.pcw.co.uk the Shell also displays plenty of statistics about intermediate hops (see screenshot 5). This is very useful, especially when your Internet connection seems noticeably slower than normal. If you are not sure what a Shell command does or which switches it uses, `commandname /?` will give you an explanation. You can divert, or pipeline, the output to a file (see screenshot 6), something which can also be used to analyse network traffic as shown in the next example.

Network monitoring

The Netstat command shows the current status of the network connections, including protocols in use and their status. Using `netstat` on its own gives a list of active TCP connections. The command `netstat > connections.txt` sends the command's output to the specified text file. If you want to compare the active connections at various times, use `netstat >> connections.txt`. The double chevron (>>) indicates that the output should be appended

Hidden Windows functions can be called from the Shell

Below left: You can use ipconfig to get a quick overview of the network configuration; and the /renew switch refreshes the settings

Below right: pathping is a built-in command which combines ping and tracert

to the end of the file, whereas a single `>` will result in connections.txt being overwritten. You can also add a time stamp to logged Netstat output by issuing two commands together (`time/t & netstat`) `>> connections.txt`.

(Key: ✓ code string continues)

In this command, the `&` processes the commands after each other; in this case, the time is output and then the netstat command is carried out. To make sure the output is well formatted and easily readable, a more complete command would be: `(echo. & time /t & netstat & echo.) >> connections.txt`

Windows process control

Windows XP shows the processes that are running in the Task Manager, including system and network capacity usage information.

This can be useful, for example, if you have carried out system configuration changes or want to check whether performance has changed after uninstalling a program. However, prolonged use

of the Task Manager has a huge drawback: the program is always in the foreground. To monitor the system, it makes sense to log the Task Manager's output. Use the command `tasklist` and divert the output with `>>` to do this. In full, the command to enter is: `(echo. & time /t & tasklist & echo.) >> processes.txt`.

The `tasklist` command can be used to unlock even more detailed information about the programs that are running. For example `tasklist /M` shows which .dll files are being used by a process. If you want to see which .dlls Internet Explorer is using, enter: `tasklist /FI "imagename eq iexplore.exe" /M`. If you use the Firefox browser, replace `iexplore.exe` with `firefox.exe`. To see which programs use a particular .dll, such as `DNSAPI`, you can create a listing with: `tasklist /FI "modules eq DNSAPI.dll"`

Transparent Windows

A little-known function which has been part of Microsoft operating systems since Windows 2000 is Windows Management Instrumentation (WMI).

Start this by entering `wmic` at the command line. The tool is useful for administrators who don't want to get involved in programming. Its strength lies in the predefined query routines and reporting options. Using the command `service` you can view all active operating system services.

That in itself is nothing special, but you can use extended commands to give you a greater insight. For instance, `servicesgetstarted`, name will let you view all the started services. To view all the services that are automatically started by

```
Options:
/?          Display this help message.
/all        Display full configuration information.
/release   Release the IP address for the specified adapter.
/renew     Renew the IP address for the specified adapter.
/flushdns  Purges the DNS Resolver cache.
/registerdns Refreshes all DHCP leases and re-registers DNS names.
/displaydns Display the contents of the DNS Resolver Cache.
/showclassid Displays all the dhcp class IDs allowed for adapter.
/setclassid Modifies the dhcp class id.

The default is to display only the IP address, subnet mask and default gateway for each adapter bound to TCP/IP.

or Release and Renew, if no adapter name is specified, then the IP address leases for all adapters bound to TCP/IP will be released or renewed.
or Setclassid, if no Classid is specified, then the Classid is removed.

examples:
> ipconfig          ... Show information.
> ipconfig /all     ... Show detailed information
> ipconfig /renew   ... renew all adapters
> ipconfig /renew EL* ... renew any connection that has its name starting with EL
> ipconfig /release *Con* ... release all matching connections, eg. "Local Area Connection 1" or "Local Area Connection 2"

C:\Documents and Settings\ktaylor.UNUBPL>ipconfig /renew

Windows IP Configuration

Ethernet adapter Local Area Connection 4:
Connection-specific DNS Suffix . : unubpl
```

SCREENSHOT 4

```
C:\DOCUMENTE~1\KTAYLO~1.UNU>pathping www.pcw.co.uk
Tracing route to proxy-2.ununet.com [62.140.213.92]
over a maximum of 30 hops:
 0  LUTWIDGE.unubpl.co.uk [10.75.36.176]
 1  10.75.32.1
 2  10.75.40.2
 3  62.140.213.1
 4  62.140.213.92

Computing statistics for 100 seconds...
Hop RTT Source to Here This Node/Link Address
 0 Lost/Sent = Pct Lost/Sent = Pct Lost/Sent = Pct
6] LUTWIDGE.unubpl
1 0ms 0/ 100 = 0% 0/ 100 = 0% 10.75.32.1
2 1ms 0/ 100 = 0% 0/ 100 = 0% 10.75.40.2
3 1ms 0/ 100 = 0% 0/ 100 = 0% 62.140.213.1
4 1ms 0/ 100 = 0% 0/ 100 = 0% 62.140.213.92
```

SCREENSHOT 5

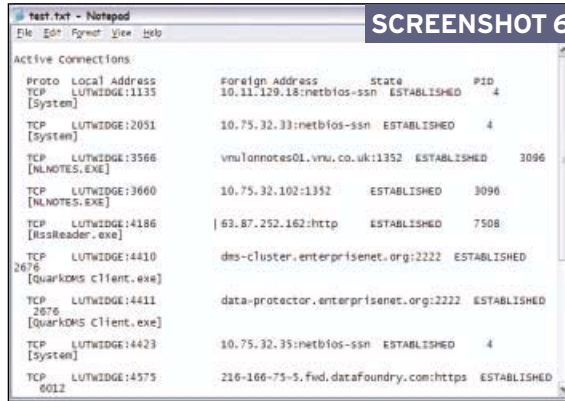
the system, enter:
service where ✓
 (StartMode="auto")

Hidden GUI applications

Ambitious XP users will almost certainly have come across the commands `msconfig`, `msinfo32`, `mmc` and `ntbackup`, which start graphical helpers. Apart from these well-known commands, the Shell has a few more surprises in store. Using `shutdown -i` you can shut down or restart other computers on a network. For example, you could shut down a keyboardless Media Center PC after a program crash using another PC without a lot of effort.

Tuning for experts

Knowing a few important Shell commands can save you a lot of time and enable you to use lots of XP functions. Although there aren't ready-made commands for every problem, you can easily create your own programs by using Shell scripts. Also known as batch files, Shell scripts consist of commands carried out one after another – in a batch, hence the name. They are very useful for repetitive tasks and where a lot of



SCREENSHOT 6

commands need to be entered, which would take a long time to do manually.

Shell scripts are saved in a text file with the ending `bat` or `cmd`. To help you learn how to use and run shell scripts we've put together a little file, `hello.cmd`, which outputs Hello World. The text is:
::This file outputs ✓
Hello World
@echo off
echo Hello World

Start the file by typing `hello` in the command prompt window. The line after `::` is a comment and is not displayed. The command `@echo`

Above: The output from Shell commands can be redirected to files

`off` prevents commands from being echoed – or displayed – to screen.

Automatic backups

Creating regular backups on your XP PC is easy using the graphical front end `Ntbackup` (see screenshot 7). If you run XP Home you'll need to install it from the disc, but it is installed by default in XP Pro.

Once installed, you'll find it in the Accessories/System Tools folder on the Start Menu.

For example, to create a backup routine that saves a particular folder every day at 18.00, is simple, but there are limits.

A small batch file can save data automatically when you shut down your PC, something the front end cannot do. The batch file should first create a subdirectory with today's date in the backup directory. This is done using the command:
mkdir E:\backup\%date%

To save the contents of a directory, you can use `Xcopy`:
xcopy c:\work e:\backup ✓
/s /m copies the contents of `c:\work` and its subdirectories (`/s`) to `e:\backup`. The `/m` switch specifies that only changed files should be

Add-ons for the Windows Shell

A standard installation of Windows XP includes over 100 useful Shell commands. If that's not enough for you, we explain how you can add more command line tools.

Support tools

The support tools on the Windows XP CD are intended for experienced users who require additional programs for error diagnosis and system monitoring. The Support folder contains about 80 extra command-line utilities.

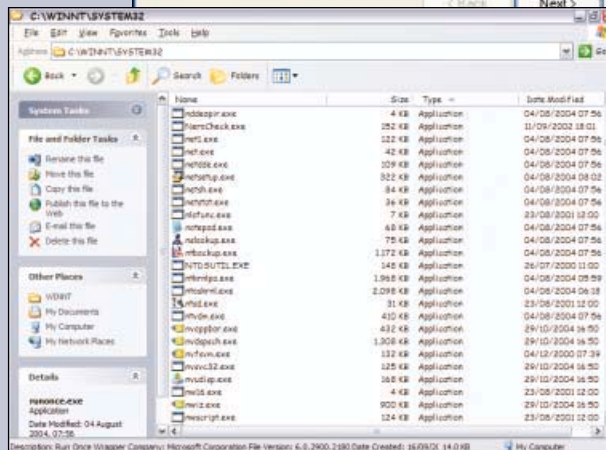
Resource Kit

This is really intended for Windows Server 2003, but it also works under Windows XP and offers more than 100 tools, such as the Raid configuration program `Disk Raid`, the DVD Burn burning engine, which can write DVD images to blanks or the copying tool `Robocopy`. This collection is free to download from the Microsoft website at www.microsoft.com; use the search phrase 'resource kit' to track it down.

Linux tools for Windows

There are three ways to use Unix/Linux tools under Windows. The GNU Utilities for Win32 (<http://unxutils.sourceforge.net>) run directly under Windows and add facilities such as the FTP client `Wget` or the Tar file compressor. Then there's the Unix environment `Cygwin` (www.cygwin.com), which runs under Windows. `Cygwin` uses a Windows DLL to emulate the Linux API. Specially compiled Linux programs then run in the `Cygwin` environment.

Finally, Microsoft provides the Unix Services for Windows, which allow Windows and Unix to work together and communicate better in heterogeneous networks. Download from www.microsoft.com/windows/sfu.



You can add The Resource Kit (above) and Support Tools to your system folder (left)



Major functions for Shell commands

There are many uses for Shell commands, but listed here are the major ones you may find useful.

Specifying IP and MAC addresses

The `ipconfig` command displays the IP address, and `getmac` does the same for the MAC address. All in one: `ipconfig /all`

Find the file types associated with a program

Use `assoc` to display the file extensions associated with a program. For example, to display the file types associated with Real Player, enter `assoc | findli "Realplayer"`

Output file system information

The command `fsutil` offers lots of information about the file system. To get information on the C: drive, if it is using NTFS, enter `fsutil fsinfo ntfsinfo c:`

Show loaded drivers

Use `driverquery /V` to generate a list of installed devices and drivers.

Compare files

You can use `comp` to check whether there are any differences

between files. To display the differences, the command is `fc filename1 filename2`

Encrypt folders

If you are using Windows XP Pro you can encrypt a folder using `cipher /E foldername` and decrypt it using the `/D` switch.

Convert FAT volumes to NTFS

You can convert FAT disk D to NTFS without data loss by using `convert d: /fs:ntfs`
Warning: Windows doesn't have a built-in tool to undo the conversion.

Show existing network connections

Active TCP connections can be displayed using the `netstat` command. Add `-a` for more details.

Check network connections

The commands `ping` and `tracert` are combined in `pathping`. Use `pathping www.pcw.co.uk` to check your Internet connection.

Run commands as an administrator

Normal work at a PC should only be done with limited user rights. You can get extended rights using the command `runas /user:username Program`

copied. The file looks like this:

```
::Save work directory to ✓
backup hard disk E
@echo off
::Create directory with ✓
current date
mkdir E:\backup\%date%
::Save work directory
xcopy c:\work ✓
e:\backup\%date% /s /m
```

Save the file as `backup.cmd`. To create the backup automatically when the PC is shut down, XP Pro users can employ group policies. Type `mmc` into the command window to open the Management Console (MMC). Click on the Local Computer Policy entry, which you first have to add by choosing File-Add/Remove Snap-In and clicking on the Add button. You can now enter your computer's policies. Select User Configuration - Windows. Double-click on Scripts (Logon/Logoff) and then Logoff. Add your Backup script. Remember to test the script beforehand, as any error could result in Windows not shutting down properly (see screenshot 9).

Our simple backup script isn't very user friendly and is somewhat limited in functionality, so could do with improvement in some areas. For example, there is a potential problem with the directory, which is created automatically - its name is always the same as the current date. This is fine until the user turns their PC off twice in one day. The directory already exists and the script does not know how to cope with this problem. The solution is to include a query

which checks whether or not the directory already exists. That's a job for the `if` operator: `if exist e:\backup\%date%` checks whether a directory with the current date already exists. Depending on the result of the query, you can carry out different actions. If the directory does not exist, it is created. If it does exist you can create a new subdirectory.

WLAN connections

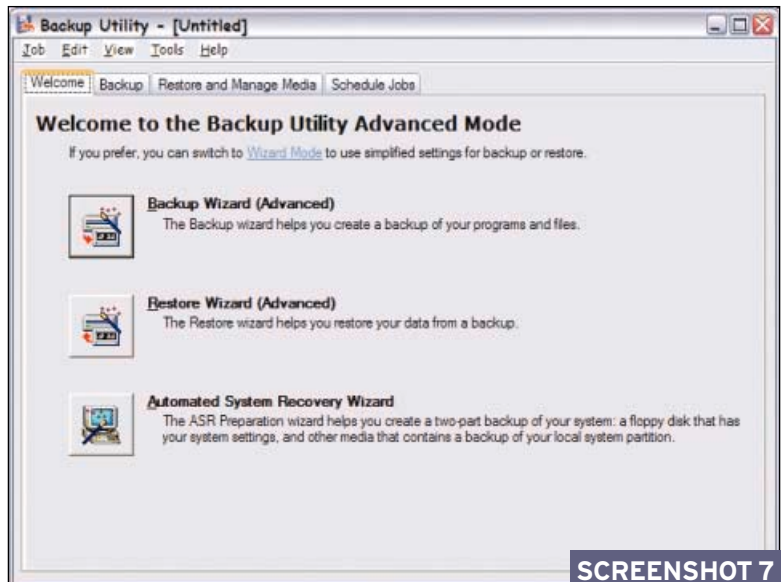
Earlier we introduced Shell commands that you can use to check a non-functioning network connection. The next sample script will help those with a small wireless Lan, where a router allocates IP addresses by DHCP IP. By

using a batch file, we can ensure we don't have to check all possible sources of errors by hand.

This lets you use a single command to find out where the problem is. The `wlantest.cmd` file works through all the possible sources of errors that could be responsible for an inability to access an Internet connection via a WLAN router. To show the user what the script is doing, a message is displayed at every step (see screenshot 8).

It writes comprehensive network diagnostic information to a log file, `wlantest.log`. If the script finds a problem it tries to repair the connection itself. If it does not succeed, a diagnosis and possible

The built-in graphical interface for Ntbackup cannot control all the backup functions



SCREENSHOT 7

solution are displayed on the command line.

Is TCP/IP working?

The first thing to check is whether or not the TCP/IP stack is working – if not, there won't be a network connection. To do this, use the ping command: to check the local loopback use ping 127.0.0.1. The script will react differently according to the ping's result. This is achieved through an IF statement:

```
if "% ERRORLEVEL% "=="0".
The query sets the error level to a value other than 0 if the ping command fails. If the value is still 0 after the ping, TCP/IP is working correctly. So, the beginning of wlantest.cmd looks like this:
echo Loopback test in progress...
(date /t & time /t) >> ✓
wlanstest.log
ping 127.0.0.1
>>wlanstest.log
IF %ERRORLEVEL%=="0" ✓
GOTO :GOODSTACK
Error handling
GOTO :END
:GOODSTACK
echo TCP/IP is working
```

A message that a loopback test is in progress will be displayed. The current date and time will be written to the log file, wlanstest.log, to which the result of the ping command are also sent. If the error level is zero, the GOTO command leads to :GOODSTACK. A message that TCP/IP is working is then displayed. If the error level is not zero, then the

TCP/IP stack is not functioning, the script will go to error handling and then to the end of the script.

Instead of the error handling placeholder, you must insert suitable code. In this case, since the TCP/IP stack is broken, there is not much the script can do and you will have to reinstall the protocol. Here's a suitable message with a brief error description:
echo TCP/IP-Stack faulty, ✓
reinstall the protocol

Is the IP address valid?

If TCP/IP is working, the next thing to check is your own IP address. If a windows computer is set up to work with a DHCP server, this must allocate a valid IP address. If that does not work, Windows XP rummages in its box of tricks and allocates an IP address in the range 169.254.xxx.xxx. The script checks whether the discarded address begins with 169.254. If not, the address allocation was successful, otherwise the script goes into error handling mode. The problem is that there is no Shell command that returns the IP address as a value. To get round this, the script uses a diversion via the ipconfig command, which lists the IP settings:

```
(ipconfig find "IP- ✓
Address") > ipstore.txt
Here the command ipconfig searches for the IP address and stores the output in the file ipstore.txt. This will only work if you have a single active network interface. If you are using multiple interfaces, ipconfig finds
```



With a shell script, you can automate troubleshooting your network connection

multiple IP addresses and cannot tell which is the correct one.

The script looks through ipstore.txt for the IP address and saves them in a variable named IP. An if query can then be carried out using IP.

The search for the IP address is carried out using a FOR loop:

```
FOR /F "tokens=2 ✓
delims=" %i in ✓
(ipstore.txt) do set
```

Inside the Windows Script Host

The commands provided by the Windows Shell are not always enough for administrators. For example, databases can't be accessed via the Shell nor is it possible to control graphical applications. Aside from this, professionals often miss a real scripting language for process automation. Since Windows 2000 these tasks have been covered by the Windows Script Host (WSH).

This is an extensive collection of program libraries that form an environment for running script files. These libraries allow you to automate Windows using programming languages.

On current XP systems, the WSH is activated by default, and includes support for JScript and VB Script – support for further languages such as Perl and Python can be added. The supported script languages are also referred to as Scripting Engines.

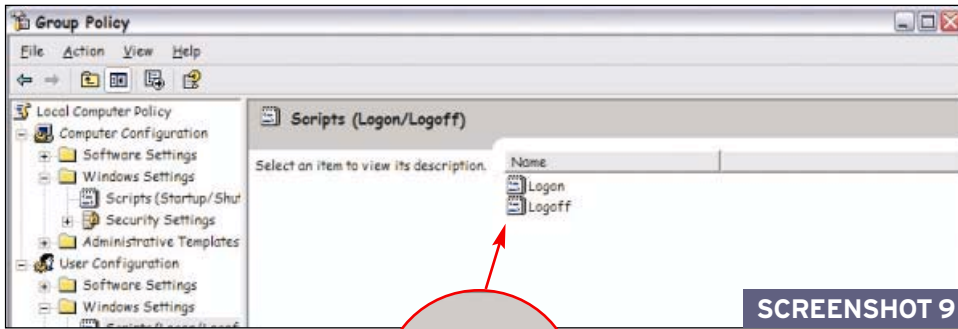
Another Scripting Host under Windows that is, an environment where scripts run, is Internet Explorer.

Security problems

If you are not an administrator, but are looking after Windows networks, you'll probably encounter the WSH in news items about security holes. For complete peace of mind, you can turn off the WSH. This is done via a Registry key which will usually have to be created first. In HKEY_LOCAL_MACHINE under Software\Microsoft\Windows Script Host\Settings, the key Enabled must exist and be assigned the value 0.



Scripts can be run in various environments, including Internet Explorer



SCREENSHOT 9

```
IP=%i
set IP=%IP:~1,15%
set IPTEST=%IP:~0,7%
```

The tokens switch specifies which column should be read and you can specify the column delimiter with delims (in our example we are using a colon). Looking in the ipstore.txt file, you can see the reason for the search: The text 'IP address' is separated from the numerical IP address by a colon. If you use ":" as a column divider, the IP address you're looking for is in the second column and is saved in the IP variable. This is done in a single pass using the SET command.

As only the first seven characters are required for comparison with the IP address range (169.254), which Windows XP allocates if required, the third SET command reduces the IP address to these seven characters. If there's an error in the value of the IPTEST variable would be "169.254". The script uses the query: IF /i %IPTEST% NEQ 169.254 to compare the IP address with the sample. The error handler, like the

The Shell scripts for logon and logoff can be administered with the management console if you are using Windows XP Professional

loopback device, can send text output or use the command ipconfig /renew to try and get a new IP address.

The next test built into the script is another ping command aimed at your own computer. The code only differs slightly from that in the loopback example. The ping target is the computer's allocated IP address, not 127.0.0.1. Alternatively, you can use the computer's name: ping %COMPUTERNAME% >> wlantest.log

To evaluate the results, as before, the error-level value is the key. If everything has worked until now, check with a ping command whether or not the router can be reached. However, the script cannot tell which IP address the router is using. One way around this is to specify the address beforehand in the source code. A more elegant solution is to use a switch.

Router address

The Windows Shell allows you not only to run the plain script using its

name, wlantest, but also to add a parameter, so the command could be: wlantest router-ip-address (where 'router-ip-address' would be replaced by an IP address). The IP address specified then has to be processed by the script:

```
echo Router test in progress...
ping %1 >> wlantest.log
IF "ERRORLEVEL%"=="0" GOTO :ROUTEROK
Error handling
```

The first parameter specified is processed by %1, up to %9 for the ninth parameter. Next, the script pings an IP address in the Internet, then a web address. If the IP address can be pinged, but not the domain name, there is a DNS problem.

Interactive Shell script

If you've bought the DVD edition of PCW, you'll find an extended version of the Shell script on the disc. Start this by entering wlantest. You will first be asked for the router's IP address. Despite its name, this batch file also works on WLANs. You could use the example as a basis for experimentation and adapt it to your own requirements.

Jörg Geiger

CONTACTS

PCW welcomes your comments on this column. Email us at: letters@pcw.co.uk. Please do not send unsolicited file attachments.

Windows versus Linux

Which is the better operating system, Windows or Linux? This question is endlessly and heatedly discussed on Internet newsgroups. However, it's hard to get a definitive answer as today's operating systems are too complex. PCW instead poses the more limited question, which shell is better?

Under Windows the case is clear. You get to the built-in command line by choosing Run from the Start menu and entering cmd into the box, but there's no such thing as a directly comparable Linux shell. As with most Linux features, there are several open-source alternatives, which include the quasi-standard Bash (Bourne Again Shell).

The case for Linux

In comparison, Linux and Bash score better than Windows and cmd.exe. The integration of programming languages means the Linux/Unix shell really is an

administrator's tool. Windows only offers batch files, which are somewhat limited, and the object oriented approach of WSH (Windows Script Host - see box on page 201) rather misses the target of developing quick solutions.



Under Linux, the Shell has always been the main centre of activity. With its built-in scripting capabilities, it leaves its Windows equivalent in the shade

Longhorn Shell

Microsoft is not developing the WSH further. XP's successor, Longhorn, is supposed to contain a new shell, codenamed Monad, which is similar to the Unix/Linux shell. The Microsoft Shell (MSH) will use a programming language similar to Perl, called Microsoft Shell Command Language and brings together WSH, WMI scripting and the command line under one roof. As the MSH is based on object oriented programming and the .Net framework, the shell programs are referred to as Commandlets. Longhorn will add capabilities to the Windows Shell which Unix, Linux and MacOSX have had for a long time.

Make XP fit for Raid 5

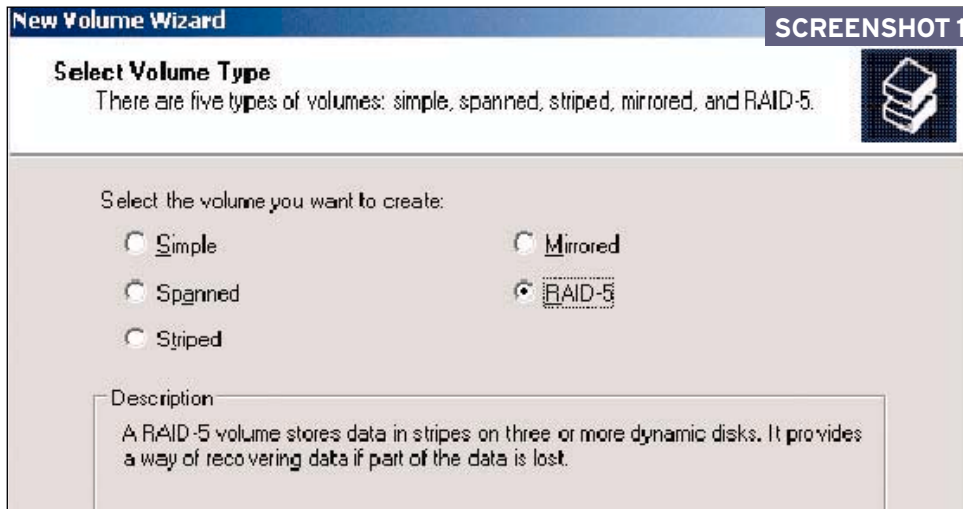
With a few tweaks you can store data across disks and protect against drive failure

Usually, Raid 5 is only available if you have a dedicated Raid controller for your hard drives or if you're running Windows Server 2003.

This month we'll show you how to make Windows XP fit for Raid 5 in just a few steps, without having to add an expensive controller card.

All you have to do is make a few slight alterations to three system files and you can set up a Raid 5 array in software only, under Windows XP.

If data integrity and performance are important to you, then you can't afford to ignore Raid. It's a technology that uses two or more linked hard disks – the name means Redundant Array of Inexpensive Disks. Under Windows XP only the simple Raid modes 0 – where data is striped across multiple drives for performance – and 1 – where drives are mirrored for data integrity – and the combination Raid 0+1 (striping and mirroring) are usually available. Four hard disks in Raid 0 mode give high capacity and impressive performance, but the risk of errors quadruples, due to a lack of redundant data. Even Raid 0+1 is not ideal. It mirrors two Raid 0 arrays,



and while it ensures a balanced relationship between performance and data security, the net capacity of the array drops by half. Raid 5 works much more effectively.

With a little encouragement, Windows XP also supports Raid 5

of one of the individual drives. If one of the hard disks fails, its data can easily be reconstructed from the parity information on the others. A software Raid 5 built by the PCW lab engineers proved to be not only reliable, but also reasonably fast under Windows XP – a test setup consisting of four Western Digital WD Raptor WD740GD hard disks managed a median data transfer rate of 190Mbytes/sec in the lab.

Raid 5 under XP

Raid 5 serves all of the hard disks in the array in turn and, for every operation, writes parity information to the hard disks in rotation. The net capacity is made up of the total capacity of all the hard disks, less that

Under the hood

dmboot.sys:

Before:

```
0000f1f0h: 74 00 54 00 79 00 70 00 65 00 00 00 57 49 4E 4E ; t.T.y.p.e...WINN
0000f200h: 54 00 00 00 53 45 52 56 45 52 4E 54 00 00 00 00 ; T...SERVERNT....
```

After:

```
0000f1f0h: 74 00 54 00 79 00 70 00 65 00 00 00 53 45 52 56 ; t.T.y.p.e...SERV
0000f200h: 45 52 4E 54 57 49 4E 4E 54 00 00 00 00 00 00 00 ; ERNTWINNT.....
```

dmconfig.dll:

Before

```
00005140h: 4C 41 4E 4D 41 4E 4E 54 00 00 00 00 53 45 52 56 ; LANMANNT...SERV
00005150h: 45 52 4E 54 00 00 00 00 57 49 4E 4E 54 00 00 00 ; ERNT...WINNT...
```

After

```
00005140h: 4C 41 4E 4D 41 4E 4E 54 00 00 00 00 57 49 4E 4E ; LANMANNT...WINN
00005150h: 54 00 00 00 00 00 00 00 53 45 52 56 45 52 4E 54 ; T.....SERVERNT
```

dmadmin.exe:

Before

```
00001c30h: 73 65 72 76 65 72 6E 74 00 00 00 00 6C 61 6E 6D ; servernt...lanm
00001c40h: 61 6E 6E 74 00 00 00 00 50 72 6F 64 75 63 74 54 ; annt...ProductT
```

After

```
00001c30h: 77 69 6E 6E 74 00 00 00 00 00 00 00 6C 61 6E 6D ; winnt...lanm
00001c40h: 61 6E 6E 74 00 00 00 00 50 72 6F 64 75 63 74 54 ; annt...ProductT
```

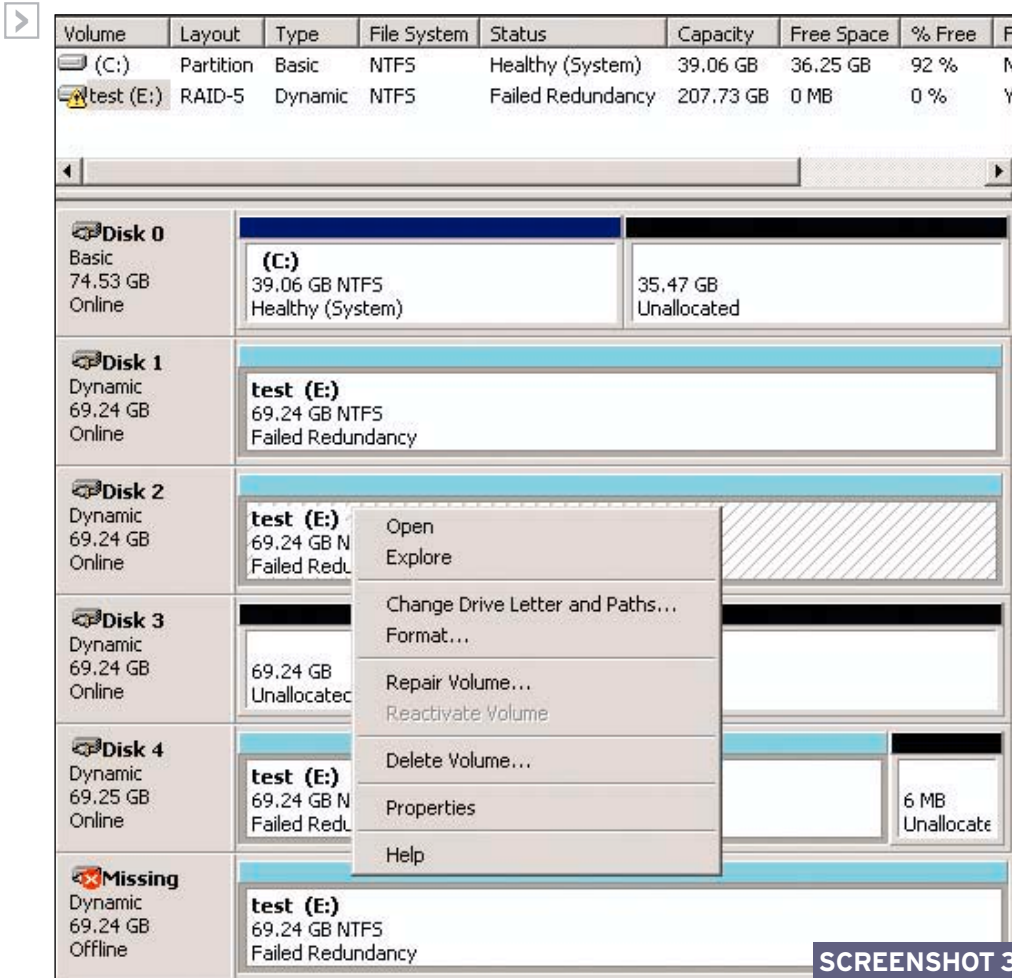
Using a hex editor

To set up Windows XP for Raid 5, you need a hex editor, the Windows XP installation CD and three files: dmconfig.dll and dmadmin.exe are in the system32 folder of your Windows installation and dmboot.sys is in system32/drivers. These original files have to be moved into a temporary folder and modified following the instructions (see boxout left). After making the alterations, copy the files back to their original places.

However, this will not work under normal circumstances, as Windows will notice that the files have been changed and attempt to replace them automatically with backup copies. If the system drive is using Fat32, the Windows security policies will not kick in. So, if your system drive uses Fat, all you need to do is boot Dos from a floppy or CD and copy the files by hand to the system32 directory.

Under NTFS, you need to use the Windows XP installation CD. Use this to boot to the recovery console and use the R key in the first option list to start in console mode. You should

Simply modify these three system files with a hex editor to enable software Raid 5 under Windows XP



SCREENSHOT 3

red icon. Thanks to the data stored on the rest of the array, repairing it is very easy. Simply right-click on the defective disk and choose Repair volume from the context menu. The data and the volume are regenerated.

Easily transportable

We also investigated whether the Raid array could be used on other systems with different disk controllers, without any difficulties – important if you have main board failure, for example.

We used an Asus P5GDC-V, based on the Intel 915G chipset as the host system for the tests. As a mass storage controller we chose the integrated Sata controller from the ICH6 Southbridge. We deliberately chose an incompatible target system – that is, one based on completely different hardware. This was the AOpen AX4SPE Max II, based on the Intel 865P and the older ICH5. Its Sata controller is not compatible with the one in the ICH6.

Connecting the drive array to the second system is easy – plug in, turn on. There's no need to worry about the order of the hard disks on the controller, or the controller type. Everything also worked when one drive was being controlled from the CH5 and three others were connected to the Silicon Image Sil3114 Sata controller.

Really versatile

Using a Raid 5 array under Windows XP is extremely easy. Moving the Raid administration from a separate controller to the operating system ensures a previously unknown level of flexibility. A Raid 5 array set up under Windows XP even remains intact if you change system.

All you have to do to get up and running is to make minor changes to three system files. It doesn't matter which hardware you are using. This software-based solution even survived the simulation of a disk crash with flying colours. If you need to store backups, or important data in a way that is as safe from hardware failure as possible, but at the same time have high regard for top performance at a reasonable cost, then you ought to consider the possibility of a Windows XP software Raid 5 solution.

CONTACTS

PCW welcomes your comments on this column. Email us at: letters@pcw.co.uk. Please do not send unsolicited file attachments.

have the modified files ready on a disk. Copy the files dmconfig.dll and dmadm.exe to the system32 and system32/dllcache folders. The file dmboot.sys goes into the Windows folders drivers and dllcache. After copying the files, restart the system and you'll be able to set up your Raid 5 array in the Windows XP disk management system.

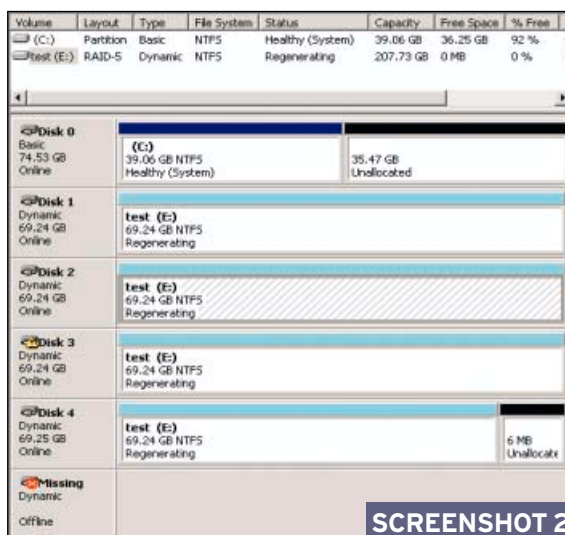
The first thing to do is to convert all of the disks to be included in the Raid 5 array into dynamic disks. A right-click on one of the disks is all that is needed to create a new volume (see screenshot 1). Windows will then create the array. This takes some time – in our example it took several hours. After doing this, though, the Raid 5 array will be available and will look to applications like a normal drive (see screenshot 2).

If a hard disk fails

Obviously, the best Raid system is no good if it can't recover from a component failure. A nightmare scenario for many administrators is the death of the disk controller. In an emergency, you may not have an identical replacement part to hand, and so it's not possible to simply put

Don't panic, if one drive in a Raid 5 array fails, it can be repaired with a single click of the mouse under Windows XP

the array – which might itself be undamaged – into another computer, because the disk controllers may be incompatible. To test the Raid 5 array, we simulated a hard disk defect by disconnecting the Sata data cable, wiping one of the hard disks and then replacing everything. The effect is shown in screenshot 3. Windows XP marks the defective drive with a



SCREENSHOT 2

The data on the defective hard disk is reconstructed from the parity information on the other drives



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Leisure

Contents

Games

- 206 UEFA Champions League 2004-2005
- 207 House of the Dead III
- Star Wars: The Sith Lords

Retro

- 209 Sord M5

Competitions

- 210 Seagate hard drives
- 211 Brother all-in-one devices

LOADING...



Student Sims

By the time you read this, Electronic Arts will have released the latest expansion pack for The Sims 2, entitled University. Although the premise sounds suspiciously as if it involves watching your Sims lie in bed all day eating Pot Noodle, there's actually a lot more to it.

In The Sims 2 - University, you'll have to go through the new 'young adult' life stage as your Sims join the campus crowd. You can live in the halls of residence or join a fraternity or sorority, where you can choose from one of 11 courses.

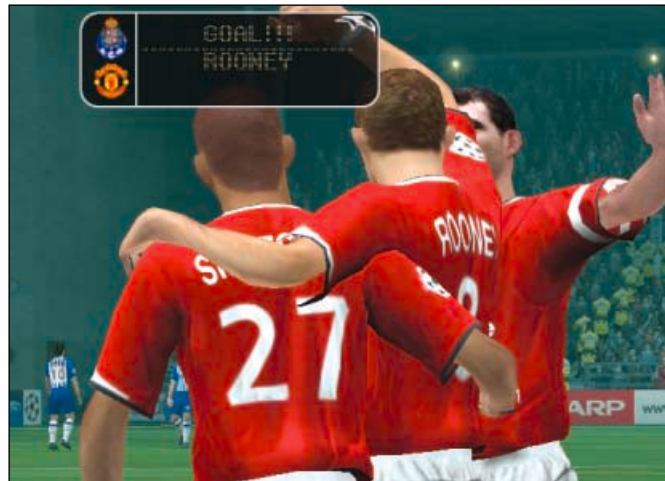
Naturally, you'll need to keep your grades on track as well as cope with all-new university-based desires and fears that are related to your Sims' social life and academic goals.

This wouldn't be a true reflection of university life without pranks, parties and money woes. Thankfully EA includes campus locations such as pool halls, gyms and coffee houses and gives you the opportunity to earn money through a part-time job.

The Sims 2 - University is on the shelves now.

UEFA Champions League 2004-2005

Lead your football team to victory in Europe



UFEA Champions League 2004-2005 (UCL) will be familiar to anyone who has played the Fifa Football series. Rather than just recycling the same game with a European assortment of teams, Electronic Arts' latest venture draws obvious influence from football management titles.

The main single-player experience consists of six modes, the first of which requires you to assume the role of manager. Your responsibility is to guide your team to Champions League glory, but rather than starting all games from 0-0, UCL throws you into the thick of the action, asking you to overcome various deficits at different stages in a match.

Subsequent matches follow a similar path, with your virtual chairman placing ever more ridiculous demands on you. Fail to meet these and you'll incur the wrath of the supporters and ultimately could lose your job.

There are other game modes that help vary the action. The home and away mode requires you to win a match over two legs, with the optional 'away goals' rule coming into play before thrusting you into extra time and penalty kicks.

UCL 2004-2005 includes several different modes for variety

The Tournament mode gives you the option to play a standard league or knockout tournament or both. This lets you replicate a domestic or foreign premier league season or create your own tournament.

The Situation mode is a subset of the main single-player game, which challenges you to beat teams by a certain margin, regain a lead with limited time, or overcome other challenges.

Like most of EA's sports simulators, the presentation of UCL is top notch and the developers have clearly spent time tarding up the game with numerous cut scenes.

Many of the big-name players have accurate representations, but you'll tire of the animations for goals, fouls and refereeing. But commentators Clive Tyldesley and Andy Gray do their best to build up the atmosphere.

Given its relationship to the rather average Fifa series, we didn't expect too much from UCL. To its credit, it is enjoyable during normal open play. Some users may find it hard to score anything other than two-yard tap-ins, but this does reduce the chance of the absurdly high scorelines seen in previous titles.

The game won't dislodge Pro Evolution Soccer from its throne as the best football simulator, but it offers a faithful depiction of the UEFA Champions League.

Will Stapley

DETAILS

PRICE £34.99 inc VAT

CONTACT Electronic Arts

www.ea.co.uk

SYSTEM REQUIREMENTS

Pentium III 700MHz CPU or equivalent

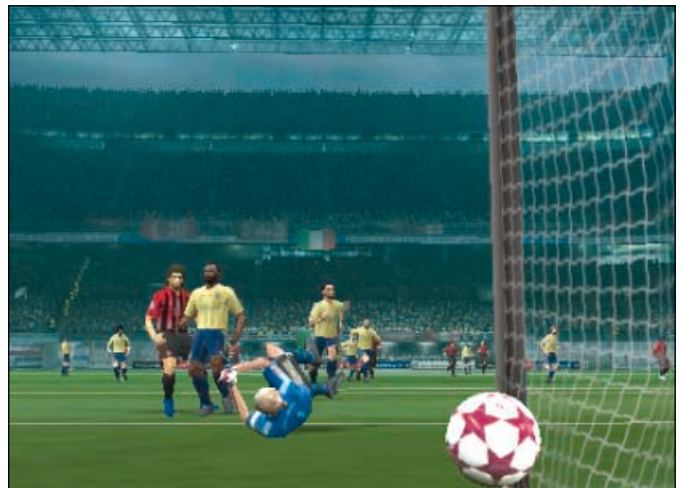
• 128MB of Ram • 740MB hard drive

space • 32MB Direct 3D graphics

VERDICT

Not the finest example of the genre, but a faithful depiction of the Champions League

OVERALL





Competitions

210 Win a Seagate Barracuda hard drive or a Brother multifunction device

Don't miss the opportunity to win one of these great prizes



House of the Dead III

Run for your life from flesh-eating zombies



House of the Dead III is the latest Sega offering to make an arcade-to-PC transition. The game takes place 20 years after the events depicted in House of the Dead II. Special agent Thomas Rogan is sent to the EFI Research Facility to discover why evil zombies have begun walking the earth, but gets captured in the process.

It is up to you, playing as Rogan's daughter Lisa (or as her accomplice Agent G in multiplayer mode), to lead the rescue mission. This involves hammering away at your mouse button or USB light-gun, as hordes of grotesque zombies do everything in their power to eat your brains.

The main difference between House of the Dead III and its predecessors is the provision of a shotgun as the main weapon. This gives the game a greater sense of carnage owing to the larger spread of damage you can inflict. Unfortunately, the process of reloading is now fully automated, which makes it extremely easy to kill things.

There is also a distinct lack of non-playable civilian characters in the game. Players can occasionally perform the odd

'rescue' mission, but this invariably involves saving a cornered Agent G from being eaten alive. You'll receive an extra life for saving him, but the game is so simple you hardly need to bother.

The game's developers have attempted to intersperse the relentless shooting action with cut scenes that try to explain the reasons behind the carnage. Unfortunately the voice acting and animation are so laughable that all sense of tension is ruined.

Playing House of the Dead III is like watching a badly acted sci-fi B-movie. It's fun for a while, but lacks substance and can quickly become dull.

Rory Reid

DETAILS

PRICE £19.99 inc VAT

CONTACT Sega

www.sega.co.uk

SYSTEM REQUIREMENTS

Windows XP/2000/ME/98 Second Edition (SE) • 1GHz processor • 128MB of Ram • 700MB hard disk space • DirectX 9.0c graphics and sound

VERDICT

Fine for a quick game, but once it's over you'll have no reason to come back to it

OVERALL



Star Wars: The Sith Lords

Become an exiled Jedi in this worthy sequel



Creating a sequel to a role-playing game with over 40 awards isn't easy. The sensible option is to stick with the same winning formula, while carefully tweaking anything that wasn't quite right first time. The good news is that the people at Lucasarts are a sensible bunch.

Set shortly after events in the first game, Knights of the Old Republic II - The Sith Lords casts you as an exiled and confused Jedi wandering the galaxy. Your adventure sees you exploring strange new worlds, collecting a ragtag band of companions and re-learning the ways of the Force. Some characters from the original make a welcome return, including the HK-47 assassin droid, while changes include new weapons, armour and powers. Another enhancement is the option to instantly switch between different weapons to adapt quickly to various combat situations.

Twirling a virtual lightsaber is always enjoyable, but the real beauty of the game is in its storyline. With even more twists than its predecessor, parts of the story change to suit the way you play the game. Follow the light side and become a galaxy-saving hero, go down the dark path for more fun or

choose a happy medium. Even your sex can change events and with six character classes to choose from, there's plenty of replay value. That said, some peripheral plot lines feel unfinished and smack of a developer on a deadline.

Despite claims that things haven't moved on graphically, the overall presentation is first class. The point-and-click interface is easy to pick up, while cut scenes follow the style of the movies to give a true Hollywood feel. The soundtrack is perhaps the best element, with an original score that could have been lifted from any of the films.

There's no doubt about it, the Force is strong with this one.

Chris Cain

DETAILS

PRICE £39.99 inc VAT

CONTACT Activision

www.kotor2.com

SYSTEM REQUIREMENTS

Windows 98SE/ME/2000/XP • 1GHz Pentium III/Athlon • 256MB of Ram • 32MB OpenGL 1.4 compliant graphics card with Hardware Transform and Lighting (T&L) • DirectX 9.0c sound card • 4x CD-Rom

VERDICT

A perfect way to get your Star Wars fix before Revenge of the Sith hits the cinemas

OVERALL



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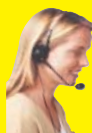
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Picture courtesy of www.oldcomputers.com

Sord M5

For a Japanese entrepreneur it was a dream fulfilled – a computer that anyone could use

In 1983, Japanese computer company Sord had 1,800 staff and profits of over ¥2.2b (£11m approx). Having recognised the potential of microcomputers in the mid-1970s, it was riding high in the home computer market. Its success drew unwanted attention though, and rumours that Sord was going bust were beginning to be taken seriously by its suppliers.

Sord was started by 26-year-old Takayoshi Shiina in April 1970 with initial capital of ¥650,000 (£3,270 approx). Shiina decided early to start his own company, but wanted to have two years' work experience first. After graduating in electronics from Tokai University, he became a sales engineer for DEC systems at Rikei.

When Shiina started Sord, his mother Hide looked after the accounting and university friend Kunihiko Akao also joined.

The name Sord was derived by taking 'So' from Software and 'rd' from hardware. Shiina felt software was more important, so gave it priority in the name. He also hoped a name that sounded like Ford could bring success.

Sord developed diagnostic software for Advantec, then the

leading semiconductor tester. Using his previous experience as a DEC sales engineer, the PDP-11 was a natural development platform, although Sord also used the Datageneral Nova and Hitachi's Hitac-10.

Manufacturing a computer system had always been on the cards and the shift from mini- to microcomputers was Sord's big chance. Shiina saw large corporations like Fujitsu, NEC, Toshiba, Hitachi and IBM as 'sleeping tigers' but likened Sord and other smaller firms to 'a dog or cat with light footwork'. As these sleeping tigers were slow to wake up to the potential of microcomputers, Sord could seize the business opportunity.

Sord's first computer was the SMP80, launched in May 1974. It was the first microchip-based machine in the world to use a floppy disk operating system (FDOS), which brought down the cost of the SMP80 to one-tenth of a typical minicomputer which in turn resulted in many sales to large corporations. The SMP80 came with 16KB of Ram and twin 8in floppy disk drives.

In the 1980s, Shiina's dream was to produce a computer which could be used by anyone. After developing an easy-to-use spreadsheet/database language

called Pips, Sord began work on a gaming computer for children. Shiina admits it was an early move, but wanted to provide computers to children and remove the perception of them being hard to use.

Shortly after developing the M23-Pips machine in 1981, Sord's product planning department began work on a small computer designed to combine high functionality with a child-friendly outlook. The M5 project would use Zilog's familiar Z80 CPU, and a rubber keyboard and cassette tape to keep costs low.

Towards the end of 1982, the M5 was complete and selling in Japan for ¥49,800 (£250 approx); Shiina felt a sub-¥50,000 price was essential for parents to consider buying a computer for their children. It was very successful, selling close to 100,000 units in its first year, with around 80 per cent going to the domestic Japanese market and the rest to China and Korea. Around one year later the M5 was launched around the world.

In 1983 Sord became the victim of a smear campaign with constant rumours claiming the company would go bankrupt. Sales may have proved the opposite, but Sord's suppliers

and banks became nervous. A year later the situation became unmanageable, so to protect his customers and employees, Shiina decided to go under the umbrella of a large corporation.

Having heard Toshiba was interested in Sord, Shiina met with its vice-president and on Christmas Eve 1984 decided to sell 50.1 per cent of Sord shares; the deal took place in February 1985. Toshiba continued developing Sord products until the 1990s, including the Motorola 68000-based M68 series.

Shiina stayed with Sord and Toshiba until May 1987, when he established Proside. This began by distributing IBM-compatible chipsets from Taiwan and Hong Kong within Japan, and now it makes PCs and components with an eye on high-end workstations. Shiina's mother, now in her 80s, still works in the accounting department.

Sord's story may have ended with the sale of remaining shares to Toshiba in 2002, but the M5 is fondly remembered by the Japanese. It certainly allowed Takayoshi Shiina to fulfil his dream of building a computer which could be used by anyone.

Gordon Laing

*Thanks to Takayoshi Shiina.
Translation by Akira Sano.*

Six Seagate Barracuda hard drives

Six readers have the chance to win a Seagate hard drive. Up for grabs are two Barracuda 7200.7 160GB NCQs, two 200GB external drives, and two stylish 5GB Pocket Drives.

Two first-prize winners will receive a Seagate Barracuda 7200.7 160GB NCQ. This internal drive won a Recommended award in *PCW*'s December 2004 issue thanks to its excellent performance. The 7200.7 NCQ uses Native Command Queuing technology, which increases performance and reliability by allowing the drive to optimise the execution order of workloads. Most hard drives access data randomly or in the order they are told to, but NCQ hard drives have the ability to work out how to access data in the most logical order possible to enhance speed and productivity.

Two runners-up will receive a Seagate 200GB external hard drive. These USB2 devices can store up to 3,400 hours of digital music, 200 hours of digital video or up to 50,000 digital photos.

A further two runners-up will receive a 5GB Pocket Drive. These stylish palm-sized USB2 hard disks have a diameter of just 7cm, weigh about 63g and can store approximately 2,000 high-res images or 80 hours of digital music – all in the palm of your hand.

For your chance to win one of these Seagate hard disks, simply answer the question below and follow the instructions on how to enter.

What does NCQ stand for?

- a) Native Capacity Quality
- b) New Command Qualification
- c) Native Command Queuing



Seagate

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PCW JUNE 2005 SEAGATE COMPETITION ENTRY FORM

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Rules of entry

These competitions are open to readers of *PCW*, except for employees (and their families) of VNU Business Publications, Seagate and Brother. *PCW* is the sole judge of the competitions and the Editor's choice is final. Winners will be selected at random from all correct entries received. No cash alternative is available in lieu of prizes. VNU will use all reasonable endeavours to notify the winner(s) within 14 days of the close of the competitions. Prizes will be dispatched direct by the competition sponsor(s) and the winner(s) name(s) and address(es) will be provided to the competition sponsor(s) for this purpose. No purchase of the magazine is necessary to enter the competitions. VNU will use all reasonable efforts to ensure that the prizes are as described on this page. However, VNU cannot accept any liability in respect of any prize, and any queries regarding a prize should be taken up directly with the sponsor of that prize.

April winners

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The Black Gold TV Card winners are: D Barton-Smith, Harold Spicer, MD Hurd, Francis Triter, Alan Bradbury, John Battersby, P Neale, R Stevens, CJ Haynes and Mark Bolland.

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Our second runner-up will win an MFC-7420. This incorporates the same features as the DCP-7025, but includes a 14,400bits/sec G3 fax modem, with eight one-touch dials and 200 speed dials, so you'll have no trouble getting your faxes off in a hurry.

Finally, one winner will get a top-of-the-range MFC-7820N. This all-in-one offers print, copy, scan and fax functions, and has a built-in network capability so you'll be able to share it among a group of users without the need to have a particular PC permanently switched on.

For more information on these products, visit www.brother.com, or for a chance to win one of your own, answer the question below and follow the instructions on how to enter.

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- b) 14,400bps
- c) 28,800bps



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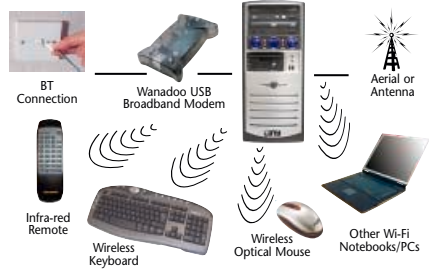


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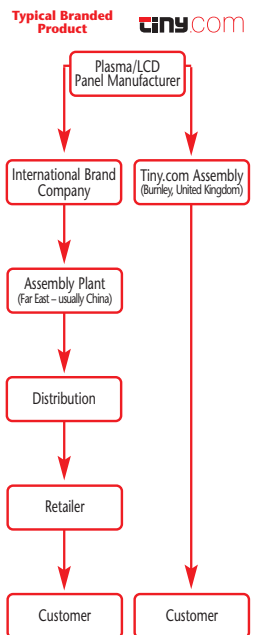
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229 Offtek

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226 Britink

224 Cartridge Express (Cartex)

228 Inkjet Direct

222 Manx

229 Offtek

229 Tonezone Consumables

PDA's & Mobile Comm.

224 i2 Mobile Solutions

Peripherals & Accessories

227 Computer Bargains

224 Linux Emporium

220 Sterling XS

Data Recovery

219 Computer Recovery

219 Dataquest

Software

222 Saversoftware

Hardware

227 Computer Bargains

225 Network Systems

220 Sterling XS

225 Zaq

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221 Web Fusion

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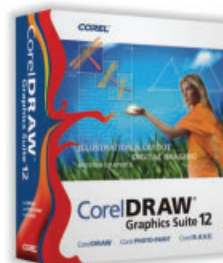
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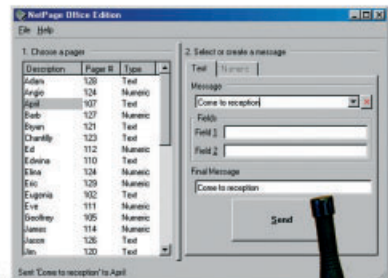


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Carrera*	see advert	164/169	Konica Minolta	see advert	14
Watford*	see advert	170/181	La Cie	see advert	117
1&1 Internet	see advert	100/101	Linksys	see advert	130
Abbyy	see advert	102	Maxtor	see advert	161
AJP Computers	020 8208 9755	108/109	Mesh Computers	0870 046 4747	23, 24, 25, 26, 27, 28, 29, 30, 31
Antec	see advert	44	Morgan Industries UK	see advert	155
AOL	see advert	89	MSI	see advert	49
Aopen	see advert	90	Netsupport	see advert	137
Asustek Computer Inc	see advert	59, 61, 63, 65, 67	Panda	see advert	106
Buffalo	see advert	80	Power Computing	see advert	214-215
Belkin	see advert	20	Reader offer	see advert	84/120
Canon	see advert	99	Rock	see advert	32-33
Data Encryption Systems	see advert	102	Sony	see advert	11
Dell Computer Corporation	01344 724 872	IFC, 5, 142-143, 83	Subs	see advert	134
D-Link	see advert	145	Tiny.com	0870 830 3127	138, 146, 182, 187, 188, 191, 192, 193, 194, 208, 212, 213, 216, 218
Dray Tek	see advert	37	Tiscali	see advert	47/133
Elite Group	see advert	71	Ulead	see advert	205
Evesham Technologies	0800 496 0800	78-79	Venus	see advert	128
Fast Host	see advert	OBC	Viewsonic	see advert	8
Filemaker	see advert	75	Watford	see advert	112
Foxcom	see advert	16-17	Westlakes	see advert	217
F-Secure	see advert	118-119	Zyxel	see advert	40
Hardsoft International	see advert	128			
Iiyama	see advert	53			
Jal	see advert	IBC			
Javelin	see advert	241			

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- Canon Image Gateway



Canon has combined some of the world's most advanced digital imaging technology with 60 years of optical heritage to deliver this deceptively simple camera, which enables you to take great photos. The Powershot A85, reviewed in *PCW* December 2004, has a 4megapixel CCD sensor, a high-quality lens and a super-fast processor to ensure accurate, clear pictures every time. To speed up focusing and optimise exposure, the camera's Isaps system analyses the scene and makes setting adjustments even before the shutter release is pressed. You can also take up to three-minute movie clips, complete with sound recording, and then play them back and edit them on the 1.8in LCD monitor. For very high-definition playback on a TV, the camera can also record up to 30-second VGA clips.

The camera can be connected via USB cable to any Pictbridge or Direct Print-compatible photo printer or Windows PC. It includes all the basics you would expect, such as built-in flash, self-timer and both automatic and manual focus. The compact and reliable Canon A85 delivers a highly professional photograph and, at under £200, is great value.

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This micro-sized mp3 player, reviewed in *PCW* March, has a massive 5GB of memory and stacks of other great features. The memory can store around 2,500 songs, while the battery lasts for 12 hours and is rechargeable and removable. Weighing only 108g and just 1.9cm deep, the Zen Micro is one of the smallest mp3 players around. It also features an intuitive vertical touchpad, which makes it

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CD1

Paragon Rescue Kit 4 Personal
Acronis True Image 8 Personal
Deslock+ 3 Personal
Cyberscrub Privacy Suite 4 Basic

CD2

PCW Toolkit



Using the cover disc

The PCW cover disc uses a web-browser-style interface. To get full functionality, you'll need to use Microsoft Internet Explorer (version 5.5 or later). Unfortunately, Netscape doesn't properly support this software. However, we have also provided links to the featured programs so that you can still copy them to your hard disk or install them manually (the standard download dialogue box will appear). Programs can be found in the \software\ folder on the disc.

Starting the disc

The CD-Rom (or DVD) should auto-start. If it doesn't, double-click the CD-Rom/DVD icon in My Computer, or open the terms.htm file on the root of the disc.

Problems?

Please note that we cannot give support on individual programs contained on this disc. If you have problems running the disc or any of its content, please note these guidelines:
FAULTY DISC > If the disc is physically damaged and will not load, return it to this address for a replacement:
PCW June 2005 cover disc
ABT, 306 St Mary's Lane
Upminster, Essex RM14 3HL
quoting reference 'PCW Vol 28 No 6'.
PROBLEMS INSTALLING/RUNNING THE SOFTWARE > Check the support page on the disc, or check the manufacturer's site.
GENERAL DIFFICULTIES > Call 08700 885 995 (9.30am to 5pm Mon, Tues, Thurs & Fri; open until 8pm on Wed and 10am to 2pm Sat). Or go to www.vnusupport.co.uk or email us at pcw@vnusupport.co.uk.

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SOFTWARE LISTING

CD1

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Deslock+ 3 Personal
Cyberscrub Privacy Suite 4

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Paragon Rescue Kit 4

If your PC won't boot, this powerful suite of tools can help you recover from just about any type of data disaster

**FULL
VERSION**



Each time you turn on your PC, Windows loads and the desktop appears. It happens every time so you might think it always will – but don't get too complacent. One corrupt Registry entry or a single driver conflict is all it takes to stop your system booting at all – even into Safe Mode.

If this happens, there's no need to panic, especially if you've installed the Paragon Rescue Kit. It comes with an ISO image you can burn to CD, creating your very own bootable recovery disc.

If your operating system won't load any more, then start from the CD instead (you might need to tweak the boot order in your Bios setup program first) and you'll have access to a variety of recovery tools.

You can view the partitions on your drive, for instance, to check that they're all still in place. If there are no problems there, load the File Manager to browse through your folders, inspect or edit crucial startup files, such as Boot.ini.

Of course, if the partition table has been corrupted, perhaps by a virus, then you may not see any files on the drive at all. But that's OK, because the Rescue Kit also comes with various partition-tweaking tools. In a few mouse clicks you can create, format, delete, move, resize, hide, mount and unmount partitions, as well as carry out advanced functions such as changing the primary slot number.

By this time you'll have spotted that the Rescue Kit boots into a customised version of Linux. There's no need for you to have any previous Linux experience, though, as it's very easy to use and, in fact, has plenty of advantages.

You can boot into a Linux Safe Mode, for instance, which provides an in-depth look at the boot process (ideal for spotting faulty hardware). If that doesn't work, perhaps because of a video problem, you can boot into PTS-Dos instead.

There's support for all the most common file systems, from Fat16 and Fat32, to NTFS, Ext2 and Ext3. And if you are (or can find) a Linux guru, then a command line option lets you try out any of your own data recovery ideas.

There's no way the Rescue Kit can solve every problem, though, even with all this functionality. Paragon realises this, and has included some backup tools as a last resort.

At their simplest you could just copy a few files from the File Manager, but there's also a complete version of Paragon Drive Backup to create an image of your complete disk or a specified partition.

If you don't have a backup drive, Paragon has also thrown in a copy of Paragon Easy CD/DVD Recorder, which can save your files to any supported CD or DVD burner. (That's most of them, but test yours, just to make sure. If you have a problem you need to discover it now, not when you're trying to recover a broken PC).

It would be something of a waste to leave all these tools on a CD (especially one you may never use), which is probably why Paragon also installs copies on your Startup menu.

So, installing the Rescue Kit also gets you a simple CD/DVD backup tool, basic Partition Manager and other utilities, all designed to help manage your PC and keep it running smoothly.

Need to know

System requirements

128MB Ram, IDE or SCSI hard disk drives with 32MB of available space, CD or DVD writer to burn recovery disc

Information

www.paragon.ag

Registration

User name: VNU

Serial number: 07489-4DB7F-A670E-8921C

Limitations

None

Key features

- Includes an ISO image of a data recovery CD
- Boot CD launches Paragon Linux or PTS-Dos
- Supports Fat16, Fat32, NTFS, Ext2, Ext3
- Checks your hard drive for surface and file system errors
- Updates your hard drive Master Boot Record to fix corruption
- Creates backups to CD/DVD
- Uses the Partition Manager and Easy CD/DVD Recorder in Windows

Bring your PC back from the dead



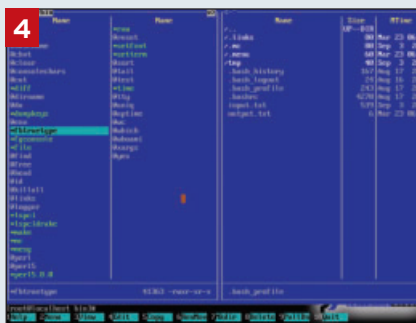
1 If Windows won't start, even in Safe Mode, make sure your PC can boot from the CD (check the Bios setup program), then insert the Rescue Kit recovery disc you created earlier. Restart your system, choose the English Language option and click Paragon Linux. (Try the Safe Mode option if this doesn't work)



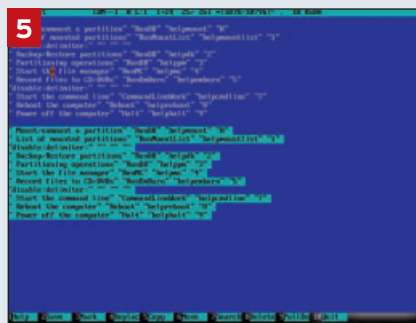
2 Paragon has a copy of Linux installed on the PC, and if all goes well it should boot to a simple graphical menu showing what you can do. Start by selecting 'List of mounted partitions', to see if it can recognise your drives. There's also a command line option for experts.



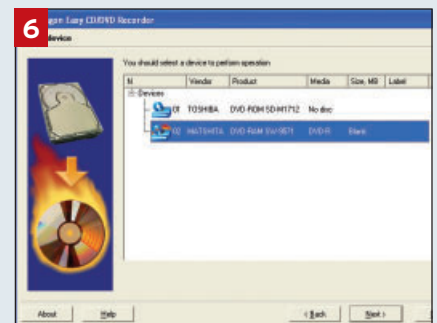
3 A corrupt disk could mean some radical surgery is necessary. Click Partitioning Options for access to all kinds of partition tweaks and an option to update your Master Boot Record. This is handy if it has been deleted, but may cause problems with some setups - get help from a more expert friend if you're unsure.



4 With any luck you won't have to try anything so drastic, though, and can browse your system immediately by starting the File Manager. There is no drag and drop here, as most actions are carried out by clicking on the buttons at the bottom of the screen or by pressing the matching function key.



5 If you want to view or edit a file, for instance, highlight it in File Manager using the arrow keys, or by clicking it with the mouse, then press F3 to view or F4 for Edit. The Editor has its own options for each function key, including F9, PulDn, which displays menus with more functions.



6 Sometimes even the full weight of the Rescue Kit won't solve your recovery problems, but at least it will let you copy vital data elsewhere. Select Backup/Restore Partitions to make an image backup of your entire drive (or partition), or use Easy CD/DVD recorder to copy a few files to disc.

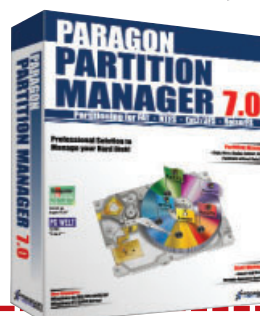
Save 30% >> On the latest Paragon tools

Key features

- >> Partition your drive within Windows
- >> Back up or restore your entire drive
- >> Manage multiple operating systems

Paragon Rescue Kit includes cut-down versions of some of its most popular tools, including Partition Manager, Drive Backup and Hard Disk Manager.

If you're looking for powerful drive management, backup and



data recovery tools, then this selection is hard to beat; visit www.paragon.ag to find out for yourself.

Click Buy now if you decide to purchase and enter the coupon code VNUPSG to claim your special 30 per cent discount.



Acronis True Image Personal



Recover from disaster with v8 of this easy-to-use tool

Need to know

System requirements

Windows 98 or later, 19MB disk space plus enough to store image files

Information

www.acronis.com

Registration

Sign up at

www.acronis.com/mag/vnu-trueimage

Limitations

None

Imagine there's been a major hard drive disaster and you're going to have to restore your data from backups.

It's at this point that you begin to regret backing up only a select few files and folders, especially as now you'll spend ages reinstalling everything before you can restore the backups at all (at which time you'll probably discover those important files you forgot to include).

There is a better way. If you run True Image Personal 8 it will create an exact image of your hard drive or a specific partition, so nothing will be left out.

In the event of any problems you can restore your drive image and the PC will return to exactly as it was, for the fastest possible disaster recovery. You may think this appears to be a time-consuming

process, but it doesn't have to be. The first time you run True Image Personal it will have a lot of data to save, but subsequently it can make incremental backups, copying only files that have changed recently.

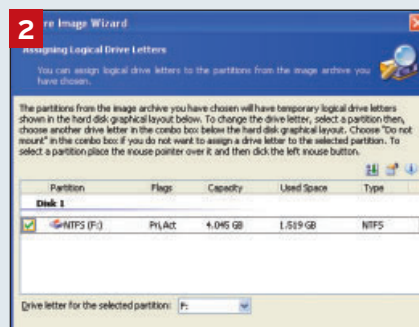
Creating image backups obviously requires a lot of disk space, but the program can help with this problem too. Data compression reduces the size of the backup file, which can then be stored on a network or external drive or split into smaller files and written to CD or DVD.

And if you don't want to restore an entire image at one time, True Image Personal will allow you to create a virtual drive to view any back up image. Now you can use Explorer to browse the drive and restore any particular files or folders that you want.

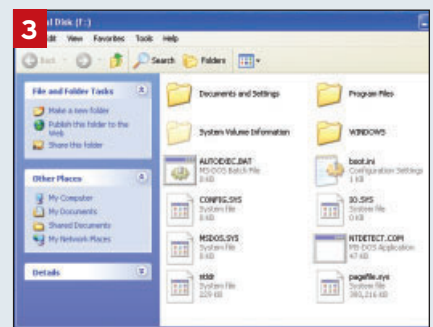
Restore your file or folder backups in seconds



1 Most image back up programs fall down if you want to restore just one or two files, but not this one. Launch True Image, double-click on Explore Image, then click Next. Use the browser to find the backup image you'd like to examine and click Next again.



2 True Image creates a virtual drive that will provide access to the files and folders stored in the backup image. Choose the drive letter you'd like to allocate, click Next to see what True Image is going to do. Click Proceed if you approve or Back to change something.



3 After a few seconds, the virtual drive is created and an Explorer window opens to let you browse (or use another file manager, if you prefer). Select any files and folders you like in the usual way, then drag and drop back onto your main drive to restore them – it's that easy.

Upgrade offer >> True Image 8 Commercial

New features

- >> Store your hard drive backups on any storage device across your network
- >> Schedule back ups
- >> Create incremental back ups

The award-winning Acronis True Image 8 enables you to back up and restore your system by creating an exact disc image of your hard drive.

The differences between the Personal Edition and Commercial Edition are listed within the application and PCW

SAVE £5 OFF RRP

readers can get True Image 8 for only £24.99 inc VAT, a saving of £5 from the retail price.

To purchase True Image 8 at this discounted price, head to

www.computrolley.co.uk/products.php?category=19.

Deslock+ 3



One of the most flexible encryption solutions around

Need to know

System requirements

Windows 98/ME/2000/XP SP1 or later,
128MB of Ram, 64MB disk space,
Internet Explorer 5 or later

Information

www.deslock.com

Installation instructions

Follow the instructions during installation

Limitations

None

At first glance Deslock+ looks like any other encryption program. Install it and you get a new right-click menu option in Explorer, letting you combine selected files into an encrypted archive (or extract files from the archive later) – similar to other programs.

You'll notice a difference when you right-click on a folder and find you can encrypt that, too. Run other applications and they can work on documents stored in that folder, while Deslock+ automatically encrypts or decrypts the files as required. When you've finished, deactivate your Deslock+ key (right-click on the Deskey system tray icon, then select Deactivate) and the folder will be inaccessible to anyone else.

You might think that sounds interesting, but it's just the beginning. Right-click the

system tray icon and you'll find a Mount Manager, that can be used to create a virtual encrypted drive. It's ideal for saving confidential files and hiding them from prying eyes when you're finished (see the walkthrough for details on how this works).

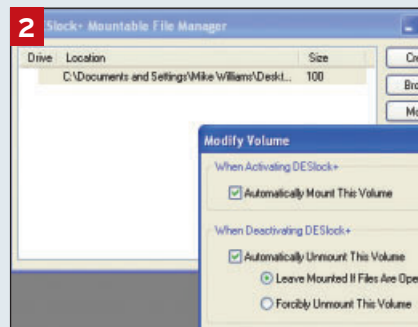
Alternatively, select Tools and you'll find options to encrypt or decrypt the contents of the current window. For instance, if you want to hide an email message, highlight the text to conceal, then right-click on the Deskey system tray icon and select Tools > Current Window > Encrypt. Enter your password and the text will be encrypted.

Deslock+ can also encrypt and decrypt the contents of the clipboard. It's a powerful, versatile suite of functions, and a great way to add encryption to just about any application.

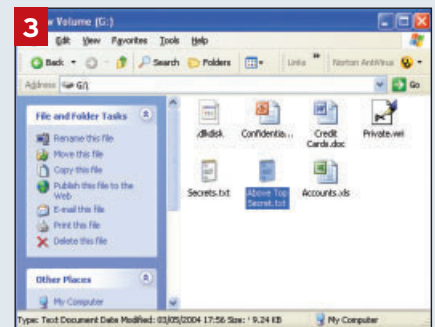
Hide your confidential files in a virtual encrypted drive



1 Right-click the Deslock+ system tray icon, then select Mount Manager > Mount Manager > Create and choose a name and folder for the file that will hold your encrypted data. Click Next and enter a size for this drive. Check both the automatic mount and unmount options to hide the drive when you're logged off Deslock+.



2 Choose the default options in the rest of the wizard, and click Finish when you're done. Select Begin and once the drive has been created it will appear in the Mount Manager. Use the buttons on the right-hand side to browse a drive, format it (wiping out your files), modify its settings and more.



3 Click Mount and Deslock+ creates a virtual drive based on the encrypted file. You can now browse it in Explorer, drag and drop files there, or use it to store data like any other drive. And when you want it to disappear, just right-click the system tray icon and select Deactivate.

Upgrade offer >> 10% off Deslock+ USB pack

Key features

- >> Better security with USB hardware key
- >> Support for multiple computers
- >> Back up and help manual

If you're planning on using Deslock in a commercial environment, you can upgrade to a commercial licence. Alternatively, why not upgrade to Deslock+, which ships with two USB Deskey tokens. These offer additional security



and your system can only be used when a USB token is connected. DES is offering PCW readers a 10 per cent discount on Deslock+. To purchase, head to www.deslock.co.uk and enter this code: VDES0605.



CyberScrub Privacy Suite 4 Basic

FULL VERSION

Need to know

System requirements

Windows 98 or later, 14MB free disk space

Information

www.cyberscrub.com

Installation instructions

Enter your details when starting the program

Limitations

Secure deletion of Files & Folders available only



Secure deletion of files with CyberScrub ensures they're gone forever

PCs really aren't designed for security. If you delete a confidential file, it ends up in the Recycle bin. Empty that and anyone can still recover it with an Undelete tool. Even wiping your disk with a secure deletion utility doesn't always work (it's a trickier programming task than you'd think). And if this method does work, the file name and date stamp could still offer some clues.

Fortunately, CyberScrub Privacy Suite will ensure those unwanted files really do disappear forever. Just click the Files & Folders button and choose whatever it is you'd like to be wiped out. Then click Erase All > Erase All and everything you've

specified will be completely deleted. Even the file name and other attributes are scrambled, meaning snoopers won't be able to extract any information from whatever remnants they might recover.

However, this also means you won't be able to restore any files you select by accident, so be cautious when using this program.

Please also note that this is the Basic Edition of Privacy Suite and many of the features are not fully functional. You can see what Privacy Guard can do, for instance, but will be told it is a Professional Edition feature that you do not have access to if you try to make use of it.

Upgrade offer >> Privacy Suite Pro 4

Privacy Suite Pro 4 is stacked with extra features, and can wipe away traces in Windows, browsers, P2P programs, news and email clients and a host of other common applications in a couple of mouse clicks or



automatically, via a built-in scheduler.

Want to find out more? Click the free 15-day trial link on the Quick Start screen to give the full program a try. Then follow the same link to order for only £31.95.

Netscape Browser 8 beta

FULL VERSION

Need to know

System requirements

Windows 98SE/ME/2000/XP, 64MB of Ram, 35MB hard drive space

Information

browser.netscape.com

Registration

Not required

Limitations

It's a beta version, so expect the occasional crash



The new Netscape user interface comes packed with extras (but it's easy to turn them off if you prefer a cleaner look)

Tired of Internet Explorer? You're not alone. It's slow, not always secure and short on features, but unfortunately many sites assume their visitors use nothing else. So for the sake of compatibility, it has to be your browser of choice or at least it did.

The latest Netscape Browser 8 is based on Firefox 1, which means you get great performance and accurate rendering of complex pages. But it also supports the Internet Explorer rendering engine, so you'll still be able to view sites written specifically for IE. With the browser automatically switching between engines as you move between your favourite sites, this really is

the best of both worlds. New security features should include warnings that appear when you try to visit a known spyware or phishing site, although this doesn't seem to be working fully yet. The excellent password and forms manager is much better, and the Privacy dialogue now includes a single option to Clear My Tracks on Exit.

You also get automatic import of Favourites, cookies and history, tabbed browsing, an RSS reader and more, all wrapped up in a highly configurable interface. It's an impressive beta and could be just what we need to restart the browser wars.

Watch out for the full version

Beta software doesn't tend to stay current for long, so the chances are there's a more up-to-date browser available as you read this.

Look at browser.netscape.com to find out more, or check out the release notes to view changes and known problems with

that version (browser.netscape.com/nsb/support/reinotes.jsp). And don't miss the Netscape message board (community.netscape.com/nscpbrowser), where you can discuss the browser and its features with other users.



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- Optical image stabiliser with VAP
- Direction accurate stereo microphone
- Two-channel audio level manual control
- 2.5" 200K colour LCD/0.44" 180K colour VF
- Three shooting modes: normal, photo, frame movie

PRINTERS



PIXMA iP2000

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Features

- 4800x1200dpi with FINE technology and 2pl Micro-Nozzles • Fast printing: up to 20ppm mono & 14ppm colour • PictBridge-ready for direct photo printing • Rapid borderless printing up to A4 size • Stylish design with dual paper trays • Windows & Mac compatible

Smart, fast and user-friendly, the Canon PIXMA iP2000 delivers the performance and style of far more expensive printers - including a practical PictBridge port for direct, PC-less photo printing.



PIXMA iP3000

£65.00
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£76.38 INC VAT

Features

- Innovative design with dual paper trays, duplex & CD-R printing • 4800x1200dpi with FINE technology and 2pl Micro-Nozzles • Up to 22ppm mono & 15ppm colour • Transparent Single Ink system • PictBridge-ready for direct photo printing • Windows/Mac compatible

Beautiful to look at and beautifully versatile, the PIXMA iP3000 offers outstanding performance and value with an innovative design and Canon's transparent Single Ink system that cuts running costs.



PIXMA iP4000

£85.00
EX VAT

£99.88 INC VAT

Features

- 4800x1200dpi with FINE technology & 2pl Micro-Nozzles • Unique ContrastPLUS technology • New design with dual paper trays, duplex unit & CDR/DVD printing • PictBridge-ready • Up to 25ppm mono & 17ppm colour • Efficient Single Ink system • Windows & Mac compatible

The stylish, space-saving PIXMA iP4000 delivers superior lab-quality photos and a host of other capabilities. Benefit from outstanding photo quality with ContrastPLUS, bringing extra depth to photos.



PIXMA iP5000

£127.00
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£149.23 INC VAT

Features

- Photo quality printer with breakthrough 1pl ink drop size • 9600x2400dpi & FINE technology • Dual paper trays, integral duplex unit & CDR/DVD printing • Up to 25ppm mono & 17ppm colour • PictBridge-ready for direct photo printing • Efficient Single Ink system

An advanced printer using next-generation technology, the PIXMA iP5000 breaks through the print quality barrier - producing industry-first 1pl ink droplets to deliver ultimate photo print quality.

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SMARTBASE MP390

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Features

- Digital Photo All-in-One, photo quality print, fax, copy & scan • Professional photo quality, 4800x1200 dpi resolution • 2pl micro-nozzles • Camera direct & card direct printing • Easy Photo Index Sheet • Super G3 fax modem: 33.6Kbps, 200 page memory • USB 2.0 Hi-Speed

The stylish SmartBase MP390 delivers photo quality printing, fast flatbed Super G3 faxing and superb colour scanning and copying. It provides camera and card direct photo printing - no PC required.



PIXMA MP750

£166.00
EX VAT

£195.05 INC VAT

Features

- All-in-One: Photo Print, Scan, Copy, Camera Direct Printing • FINE Photo print quality • Dual paper trays, integral duplex unit & CDR/DVD printing • PictBridge compatible • Duplex and borderless printing/copying, CDR/DVD printing • CCD Scanner: 2400x4800dpi

The PIXMA MP750 is a superb fusion of advanced photo printing, scanning and copying. With added features like built-in auto duplex, dual paper trays, ADF and PictBridge Camera Direct photo printing.



PIXMA MP780

£192.00
EX VAT

£225.60 INC VAT

Features

- Photo print, scan, fax, copy, Camera Direct Printing • FINE Photo print quality: 4800x1200dpi, ContrastPLUS • Up to 25ppm mono, 17ppm colour • 33.6Kbps fax modem • Duplex & borderless printing & copying • 35-page ADF, Dual paper trays • CCD Scanner: 2400x4800dpi

With stylish contours and beautiful finish, the PIXMA MP780 is the ultimate time and work-saver, offering exceptional photo printing, faxing, scanning and copying performance in one compact machine.



LASERBASE MF5650

£315.00
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£370.13 INC VAT

Features

- Laser All-in-One: printer, fax, copier, colour scanner • Fast 18 ppm/cpm, 1200 x 600 dpi (enhanced) • 3 secs per page • faxing • 256-page fax memory, UHQ technology • Colour CCD scanner, 1200 x 2400 dpi, 48/24-bit • USB 2.0 Hi-Speed interface • 50-page ADF

The LaserBase MF5650 brings unparalleled productivity to All-in-One ease. Combining a laser printer, fax, copier and colour scanner in one stylish unit, it delivers impressive quality at a fast speed.

LASERS



LASERSHOT LBP1120

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Features

- Quick start up • 600 dpi, up to 2400 x 600 dpi • 10 ppm • Low power consumption • Flexible paper handling • All-in-one cartridge

The Canon Laser Shot LBP1120 packs all the features you need into one compact, space-saving unit and gives you crisp, clean and professional printing-at an affordable price.



LASERSHOT LBP3200

£118.00
EX VAT

£138.65 INC VAT

Features

- Quick 18 pages per minute • Fast first print out: less than 10 seconds • 600 x 600 dpi print resolution (2400 x 600 dpi equivalent) • CAPT (Canon Advanced Printing Technology) • All-in-One cartridge • 250-sheet paper cassette • Smart design, small footprint

Compact, convenient and extra easy to use, the LBP3200 produces fast, professional quality prints. Features include highly efficient Canon Advanced Printing Technology and an All-in-One cartridge.

CAMCORDERS



MV800

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Features

- 1/6" 800k pixel CCD & Canon's DIGIC DV for vibrant, emotional colours • Powerful 20x optical zoom • Hi-res 16:9 Mode for widescreen footage • Electronic Image Stabilisation • Fully automatic Easy Mode for simple point-and-shoot operation • 2.4" colour LCD, colour viewfinder and intuitive menu navigation • Night Mode

The MV800 is uncomplicated, giving high quality results. A powerful 20x optical zoom lens, DIGIC DV processor & high resolution 16:9 widescreen recording combine with new Easy Mode to produce vibrant and effortless footage.



MV850i

£CALL

Features

- 1/6" 800k pixel CCD & Canon's DIGIC DV • Powerful 22x optical zoom & wide attachment • 16:9 Mode for widescreen footage • Electronic Image Stabilisation • Fully automatic Easy Mode point-and-shoot operation • 2.4" colour LCD viewfinder • Super Night Mode with built in Mini Video light • SD and MMC memory card

Introducing the 22x optical zoom MV850i - a compelling DIGIC DV performance and hi-res 16:9 mode, for enhancing wide-screen experience and true digital still capability. Effortless, fully automatic 'Easy Mode' for quality without complication.

CAMERAS



POWERSHOT A510

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Features

- 3.2 MP CCD • 4x optical zoom • 20 shooting modes • Canon Visionary Technology • 9-point AIAF • Up to 3-minute movie clips with sound • Large 1.8" LCD • PictBridge/Canon Direct Print compatible • Print/Share button • CANON IMAGE GATEWAY (Not available in all regions)

From the second you switch it on, the compact, affordable and easy-to-use 4x optical zoom PowerShot A510 is perfectly equipped to help you explore the world of digital photography.



POWERSHOT A520

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Features

- 4.0 MP CCD • 4x optical zoom • 20 shooting modes • Canon Visionary Technology • 9-point AIAF • Up to 3-minute movie clips with sound • Large 1.8" LCD • PictBridge/Canon Direct Print compatible • Print/Share button • CANON IMAGE GATEWAY (Not available in all regions)

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The competition is likely to be challenging, with teams bringing a variety of skills to the pitch. From the creative flair of Soho's media buying agencies to the steadfast commitment and solid strategic planning of both technology manufacturers and resellers.

- First prize will be a day go-karting in London followed by dinner at a top West End Restaurant
- There will also be prizes for runner-ups, plate and wooden spoon winners!

The event will include a buffet for all and a fully licensed cash bar at the venue.

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£999 PC and peripherals bundle

If you want a fast PC that offers excellent value for money, check out our group test of the latest PC bundles for £999 inc VAT. Each package includes at least two peripherals, including printers and scanners and mp3 players. There's bound to be a bundle that's right for you.

Waterproof gadgets

Fed up with getting sand kicked in your mp3 player on holiday or simply want to get a snap of that fish while snorkelling? *PCW* is here to help, with a group test of waterproof and weatherproof kit.

Surrounded by sound

Most PCs come with built-in audio, but if you're after features such as 24bit audio, 7.1 surround sound or optical output, don't miss our group test of six top-notch soundcards. And, as a bonus, we've rounded up the cream of the crop in surround sound speaker systems.



Find out which gadgets are best protected against the elements

For regular updates of what's in July's issue, go to

www.pcw.co.uk/magazine/nextissue

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Check out our group test of the best soundcards and speakers available



JUNE 1985

The June 1985 cover brought a taste of America, with a large picture of fictional rabble-rouser 'Uncle Sam' and the slogan 'Uncle Jack wants you!' Jack, of course, being Atari president Jack Tramiel.

Inside, *PCW* ran an exclusive review of the Atari 520ST – one of the first machines to use a user-friendly GEM windowed interface and the Motorola 68000 processor.

Elsewhere, we looked at the Hewlett-Packard Integral PC – an all-in-one machine with a combined screen and base unit. It weighed just 11kg, so it was ideal to transport.

In the news section, Guy Kewney tracked down a Sharp



Atari 520ST: Leading the way with a Motorola 68000 processor

processor that turned Z80 processor-based PCs into multitasking systems. The 8575 – a multi-tasking support processor (MTSP), worked in conjunction with the Z80 CPU and could control up to 255 tasks on a priority basis.

Finally, we helped round off the issue with a review of Seaside Special – a game that poked fun at Margaret Thatcher's cabinet, and we also rather unwisely instructed a reader from Dudley on how to start a career in hacking.

JUNE 1990

We tested the newly-launched NEC Prospeed CSX – the first colour laptop computer – in June 1990. Almost the size of a normal desktop PC at the time, it was bulky and, at 8.3kg, it wasn't really a peripheral to carry around.

Its handle left us wishing for more, and tester Guy Swarbrick complained that nobody had yet designed a really good handle for PCs. Its performance wasn't great either, and even NEC admitted the colour screen wasn't that good.

Commodore's Amiga 3000 – described as the first machine capable of handling 'tests, graphics, animation, video and high quality sound in an all-in-one multi-tasking environment' – had just been introduced. The

new machine was smaller, faster and prettier than its predecessors, but it still didn't come with Unix, which was a big drawback.

The company was also about to launch a £700 Amiga with a built-in CD-Rom drive.

We also looked at PC sound boards as Ad Lib, Roland and Creative Labs all had new audio expansion cards out. We tested the three products over four pages and concluded that Roland's LA-PC1 was the winner. We said the Creative Labs' Sound Blaster was 'dated' and its features 'weren't that attractive'. Of course, the Sound Blaster went on to outsell the other products on test by a long way.

JUNE 1995

Back in 1995, the biggest thing on our minds was the annual *PCW* Awards. To celebrate their fifth anniversary, we opened the nominations out to the readers – leaving the staff to argue over which technology or software should scoop the final honours.

The list of winners will be familiar to today's readers, although Gateway – winner of Best Direct PC Dealer and Best After Sales Service – is no longer with us, having returned to being a US-only vendor several years ago. Compaq, IBM and Evesham took home vendor awards, while Hewlett-Packard won Best Printer and Best Budget Printer. Adobe Photoshop 3 took Best Creative Software, with Microsoft Office 4 winning Best Suite. Apple won the prize for Best PC System for the Power Mac 6100/66.

Elsewhere in the issue, ISP Eunet warned against the dangers of too much video and voice traffic clogging the Internet. A program called CU-Seeme, notoriously associated with dodgy computer sex, proved to be a hog, interfering with other traffic and jamming the Internet. The increase in voice traffic through VoIP services, such as the newly-launched Net2phone was also taking its toll on the pipes.

In response, the cable companies finally agreed a strategy that would see them becoming the largest national Internet providers with a proposed 10Mbits/sec service. Ten years on and we can smile at those predictions – only now are we seeing 8Mbits/sec ADSL services being rolled out and the cable providers can hardly claim Internet domination.

JUNE 2000

BT was making headlines in our June 2000 issue. As the nation geared up for high-speed, unmetered and always-on Internet access, BT had already upgraded 400 of its exchanges and had plans for another 100 to be broadband-enabled. Actual implementation of broadband was looking a little shaky with Internet service providers arguing with BT about pricing plans.

Cable providers seemed to be offering the best deals. Telewest announced a 512Kbits/sec service for just £50 per month and had plans to introduce a wireless option. As with all new technologies, timetables were slipping and AOL's Matt Peacock predicted that widespread consumer ADSL services wouldn't arrive until August 2000. Who would have thought back then that the unlimited nature of broadband would actually start slipping away five years later as ISPs imposed caps?

Alan Sugar was also grabbing his fair share of the limelight with the brand new email phone. The E-m@iler was sold at £79.99 and allowed users to send and receive email, phone calls and fax transmissions. However, several snags held the E-m@iler back, such as the lack of a browser and a 12p charge to access email in addition to standard line charges.

Finally, a reader complained about the fact that the magazine issue dates were always two months ahead. In a flash of inspiration, then staff writer Will Head replied that the issue date should be regarded not as an on-sale date, but as a best before date. We'll stick with that argument for now.

The *PCW* team

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Jim Martin, Labs Editor, PC Pro, March 2005 Issue

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"The JAL Gemma is a more complete system than its competitors and has a lot more upgrade potential."

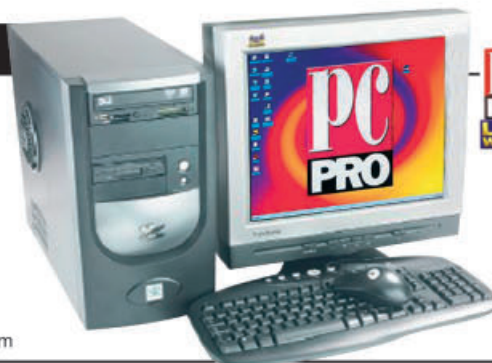
Ben Henley, Labs Writer, Computer Buyer January 2005 Issue



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- ViewSonic E72f+SB Monitor
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"The superb upgrade potential makes the JAL a worthy winner."

Jim Martin, Labs Editor, PC Pro, March 2005 Issue

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- Unlimited site traffic
- Latest firewall protection
- Redundant server disks
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- SSH secure access
- 5 star online control panel
- Bandwidth monitoring
- NEW Graphical web stats
- Point unlimited domains to your web space
- Bulk domain name registration account
- Windows 2003 IIS6
- Red Hat Enterprise Linux

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- Easy site creation tool - 3 pages included
- Media streaming (option)
- NEW Password protection
- Raw log files
- XML, SHTML (Windows) & DHTML
- ODBC database access
- Microsoft SQL Server support (option)
- NEW MySQL 150 MB

LIVEMAIL

- NEW 600 POP3 mailboxes
- Auto-responders
- Unlimited forwarding & email aliases
- NEW 5 Advanced mailboxes
- NEW Roaming SMTP access
- NEW Spam filtering (5 mailboxes)
- Virus scanning (5 mailboxes)
- Web mail
- NEW Advanced SMS alerts

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WEBSITE & DOMAIN

- NEW 5 GB web space
- NEW unlimited sub-domains
- NEW 50 FTP access accounts
- Unlimited site traffic
- Latest firewall protection
- Redundant server disks
- NEW SSL secure web space
- SSH secure access
- 5 star online control panel
- Bandwidth monitoring
- NEW Graphical web stats
- Point unlimited domains to your web space
- NEW Load balancing
- Bulk domain name registration account
- Windows 2003 IIS6
- Red Hat Enterprise Linux

SITE BUILDING & SCRIPTING

- NEW ASP.NET & .NET Framework 1.1
- PHP, Perl CGI
- Python CGI
- Compiled CGI and SSI
- NEW Microsoft SQL Server 150 MB
- NEW MySQL 300 MB
- ASP scripting
- FrontPage Extensions 2002
- NEW Custom error pages
- Easy site creation tool - 3 pages included
- Media streaming (option)
- Password protection
- NEW Advanced password protection
- Raw log files
- XML, SHTML (Windows) & DHTML
- ODBC database access

LIVEMAIL

- NEW Unlimited POP3 mailboxes
- Auto-responders
- Unlimited forwarding & email aliases
- NEW 5 Advanced mailboxes
- NEW Roaming SMTP access
- NEW 1 Exchange mailbox
- NEW Spam filtering (5 mailboxes)
- Virus scanning (5 mailboxes)
- Web mail
- NEW Advanced SMS alerts

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